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Construction Methods AND EQUIPMENT

December, 1961

Rubber-Tired Tractors Push-Load 50-Yd Scrapers . . . 58

Contractor-Built Rig Lays Continuous Road Reinforcing . . . 74

A McGRAW-HILL PUBLICATION

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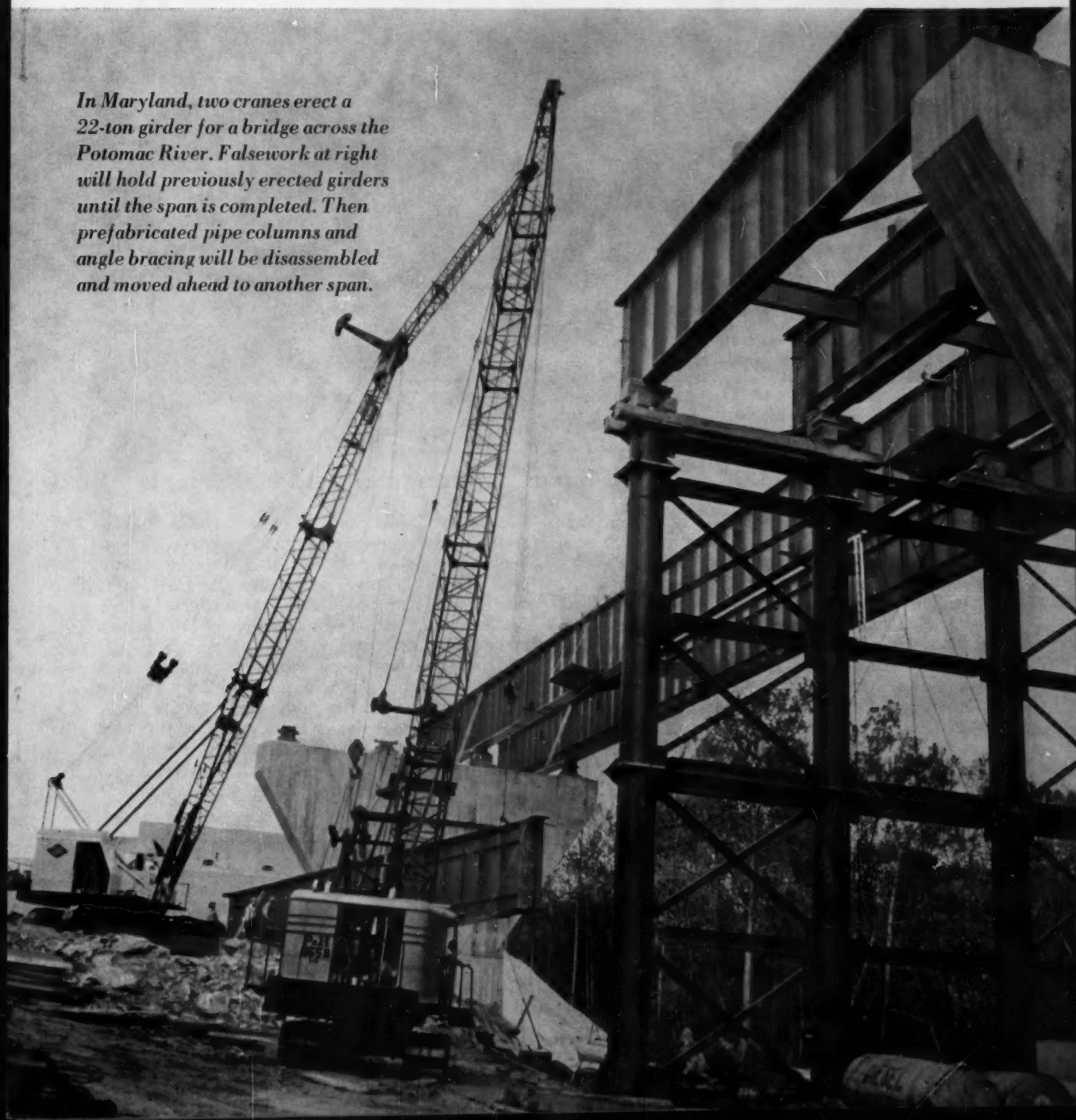
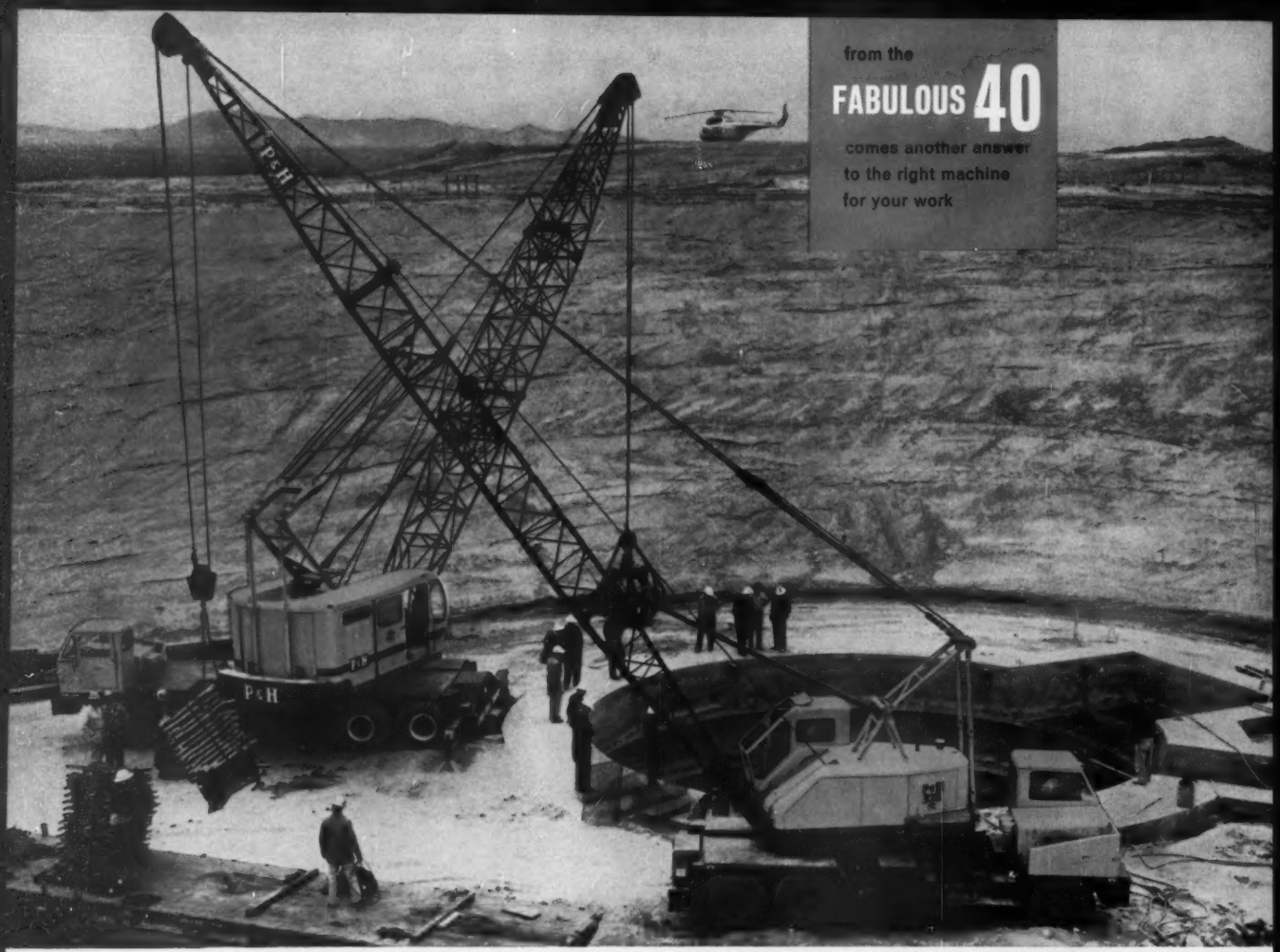
Crawler-Drawn Scrapers—They Still Earn Their Keep 93



In Maryland, two cranes erect a 22-ton girder for a bridge across the Potomac River. Falsework at right will hold previously erected girders until the span is completed. Then prefabricated pipe columns and angle bracing will be disassembled and moved ahead to another span.



25-ton P&H 325-TC in foreground teams up with 40 ton P&H truck crane on missile base job

your toughest lifts are routine for the 25-ton P&H 325-TC

you get $2,425.00 worth of bonus *extras* as standard equipment

Bonus extras give the 325-TC its exceptional stamina and versatility . . . make it a speedy producer on countless tough jobs. Take the FOUR-speed transmission in the upper, for example . . . it enables you to pick up heaviest rated loads at *low* engine speeds for safest, most precise control . . . lets you match the right speed to your loads to move them at extra fast line speeds for highest possible production. To get a TWO-speed transmission on other makes will cost you an extra $1,200.00 . . . if you can get one at all . . . yet you get FOUR speeds as standard without extra cost on this P&H.

Additional P&H bonus extras include: P&H "triple-safe" independent power raising and lowering boom hoist that takes the problem out of reaching in tight, high spots and provides safe, "inching" control on the ticklish jobs • Friction-type swing brake for precise control • 28-roller Live Roller Circle plus 3 sets of adjustable double-hook rollers between upper and carrier • Torsion bar front axle—an exclusive feature offered only on P&H truck cranes—stabilizes the P&H built carrier when working without outrigger • Air brakes on all 6 carrier wheels with over 1100 square inches of braking area.

All of these features are built around Power Box design and the P&H built carrier, giving you the lowest center of gravity found on any truck crane.

Call your P&H dealer for a complete rundown on the 325-TC's bonus extras that are worth $2,425 to you. He'll arrange a demonstration for you. For new literature TX-347 mail coupon.

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Milwaukee 46, Wisconsin

61-584

Please send me the new literature and specification sheets on the P&H Model 325-TC truck crane with complete attachments for HOE, SHOVEL, DRAGLINE, CRANE AND CLAMSHELL.

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For information check your vehicle manufacturer, or write *B.F.Goodrich Aerospace and Defense Products, a division of The B.F.Goodrich Company, Dept. CM-12, Troy, Ohio.*

Hi-Torque brakes give *full-circle contact* around the drum for maximum stopping power. Brakes can be operated by air-over-hydraulic, direct-hydraulic, or direct-high pressure air actuation.

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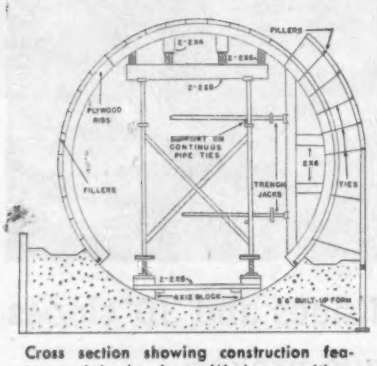
National Engineering and Contracting Co., Cleveland, relied on Symons steel-ply forms to pour a huge quarter mile sewer.

The $400,000 sewer is 13 feet in diameter and 15 inches thick. To meet the 3½ month contract deadline, the inside was formed with three sets of jumbo-mounted Symons forms similar to a gang section. These "jumbos" had hinged ribs



Cross section showing construction features of jumbo form. Workmen, with a block and tackle manually pulled the "jumbo" 30 ft ahead for the next pour.

and rode on plank rails. Each section was 32′ long and was constructed with 12 inch by 8 foot Symons steel-ply fillers. Workmen were able to strip, move a section 30 feet and re-position in one hour. Symons new gang-form bolt simplified assembling and stripping by allowing the ties to be broken back before moving the sections.

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DECEMBER, 1961

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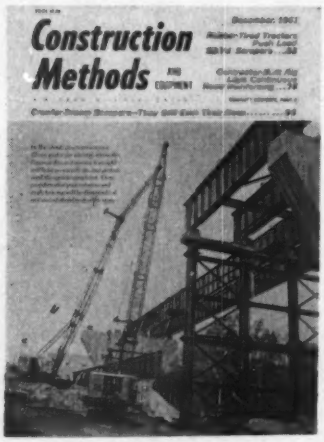

ON THE COVER

Two crawler cranes—one a P&H, the other a Lima—team up to erect a 22-ton girder section for the Cabin John bridge across the Potomac River near Washington, D.C. When the girder section is in place, the Lima will hold one end of it until the P&H lifts a suspended section into place. Ends of previously erected cantilevered girder sections rest atop falsework bents made of prefabricated columns and bracing. The falsework, which can be erected to any height, is 100% salvageable. It will be reused at other locations after this span is completed (*story, p. 60*).

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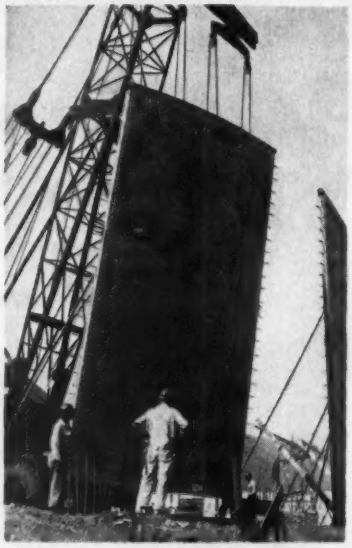
NEXT MONTH

What do contractors think of present equipment depreciation tax schedules? How do present depreciation schedules effect their business? What are the chances that the tax laws will be revised during 1962? The answers to these and other questions concerning the vital issue of depreciation are a highlight of CM&E's special report on construction machinery. Other articles will cover recent breakthroughs for major equipment types, new developments in component design, and the pro's and con's of leasing.

Pay Dirt in This Issue

Two Mixing Methods Speed Paving Project 54

By utilizing a central-mix plant and two road-mix spreads to produce bituminous base materials, a Kansas paving contractor boosted production and reduced delays during a wet construction season.



Wall Panels Go Up At Six-Per-Hour Pace ...87

It took the contractor just 3½ days to erect 148 precast concrete wall panels weighing as much as 25 tons each. One crane, working through a specially designed pickup arrangement, handled the entire project.

80-Ft Rock Cut Is Blasted in One Lift 98

Shooting the full depth of an 80-ft-deep rock cut in one lift calls for blasting know-how and careful timing with properly spaced delays. The results? Good breakage, high production, and low powder costs.

Rubber-Tired Tractors Push-Load 50-Yd Scrapers 58
Prefabricated Falsework Supports Bridge Steel 60
Contrasting Borrow Techniques Supply Road Fill 62
Sheet Pile Bracing Passes Through Concrete Wall 65
Contractor-Built Rig Places Continuous Reinforcing 74
Crawler Scrapers Still Are Good Earthmoving Tools 93

White concrete traffic marker on Northampton County Road, Palmer Township, Pa. General Contractor: J. H. Beers, Inc., Bangor, Pa. Marker Contractor: Polselli & Angelucci, Philadelphia, Pa.

Traffic markers that you can see and hear ...day and night

A dual-purpose traffic marker . . . of scored white concrete made with ATLAS WHITE portland cement. By day, its whiteness stands out in sharp contrast to the adjacent pavement, clearly outlining the lane ahead. By night, its ribbed surface catches headlight beams and reflects them back to the driver, forming a visible ribbon of white. On rainy nights, the marker becomes even more reflective. In addition, when tires ride the corrugated surface, a distinct "humming" sound is heard, warning the driver that he is veering out of lane. For more details on the construction of this highway safety feature, write: Universal Atlas, 100 Park Avenue, New York 17, N. Y.

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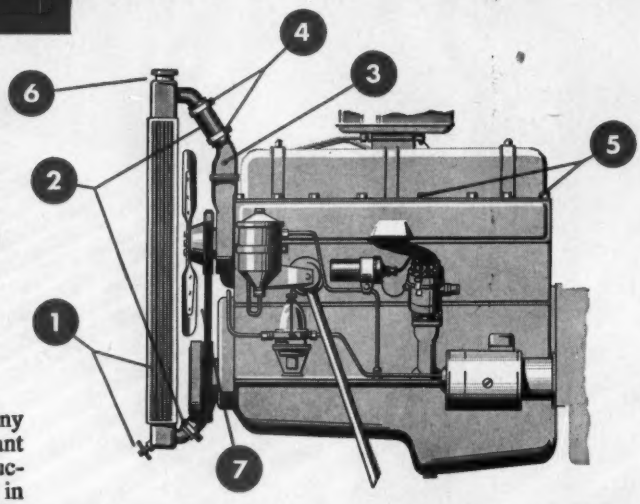
LUBE LOGIC

Tips for more

Antifreeze: what's the best type to use; how to make sure you get maximum protection



It's getting pretty close to antifreeze weather in many parts of the country, which brings up two important points: choosing the best type of antifreeze for construction machinery; and making sure the cooling system is in good condition, so the antifreeze can do its job properly.

The right type of antifreeze is the permanent kind. Construction equipment engines operate best at 180°F jacket temperature which is ten degrees higher than the boil-off point for alcohol. Permanent antifreeze (like Texaco Startex) will stay on the job at the temperature that's best for the engine. *Don't* substitute salt or kerosine solutions. They won't freeze, true enough, but they're tough on engine components.

It's important to keep the cooling system in good shape for three reasons: first, because antifreeze that gets into the crankcase causes severe varnish deposits on pistons and rings; second, because you want the antifreeze solution to circulate properly; and third, because antifreeze lost through a leak costs a lot more to replace than just plain water. Before you add antifreeze, check the following points:

1 Clean the cooling system—drain and flush thoroughly.
2 Check the radiator hoses, replace any that are soggy or collapsed.
3 Check the thermostat. If the thermostat is in good condition, the thermostat discharge connection will remain closed until the coolant in the water jacket is up to operating temperature.
4 Tighten connections on hoses that don't need replacing. Antifreeze can pass through spaces too small for water leaks.
5 Tighten cylinder head, oil cooler and other hold-down bolts.
6 Check radiator filler cap gasket.
7 Inspect and adjust fan belt.
8 Now you're ready to put in the antifreeze.

After the antifreeze is in, it's a good idea to:

1 Check the level at operating temperature.
2 Check for leaks.
3 Check water pump packing nut adjustment.
4 Check cooling solution with suitable hydrometer to make sure of protection temperature.

Metal concrete forms can be readied for re-use faster

You can get metal concrete forms cleaned up and back on the job faster if you spray them, before use, with Texaco Stazon. Use the Stazon just as it comes from the container for best results. Field reports say it gives the concrete a fine smooth finish, and the Stazon prevents sticking, shortens clean-up manhours.

Magneto Lubrication: three *IF*s and a *BUT*

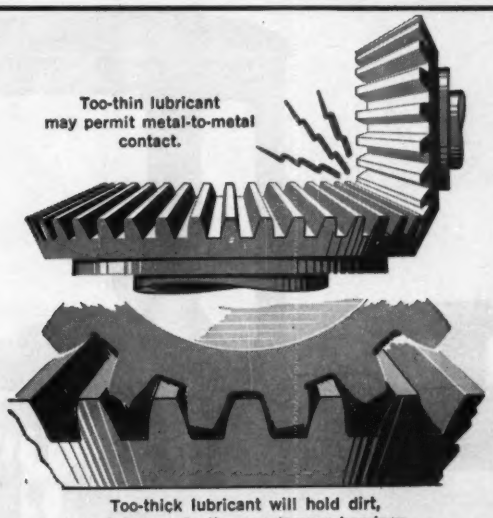
IF the magneto is oil-lubricated, apply a few drops of oil every 500 hours.

IF the magneto is grease lubricated, apply Texaco Marfak Multi Purpose 2 every 100 hours.

IF the magneto is located near the engine exhaust pipe, lubricate with Texaco High Temp Grease every 50 hours.

BUT if the bearings on your magneto are *sealed*, follow manufacturer's recommendations and let the distributor do the servicing.

efficient equipment performance



Too-thick lubricant will hold dirt, pack in gear teeth, may damage bearings.

Key points in choosing gear lubricant for gyratory crushers

One of the toughest lube jobs on a gear-driven gyratory crusher is the gears themselves. They're partly protected by oil-tight cases and dust rings, but some contamination is inevitable, and it's essential that you choose a lubricant that can take it.

Viscosity is very important. These gears are very heavily loaded, so too-low viscosity may not provide a film thick enough to prevent metal to metal contact. On the other hand, if the lubricant is too thick, it will hold grit and dust in suspension, and let it develop a scoring action on the gear teeth. In addition, dust tends to dry out lubricants, and also creates a "packing" condition between gear teeth. This packing of dust and dried lubricant can build up undue pressure on gears and bearings.

Your best bet is a lubricant with a viscosity between 50 and 160 seconds Saybolt Universal at 210°F, with extreme pressure characteristics. These specifications will get you a lubricant with a good compromise between too thick and too thin. Ask any Texaco Lubrication Engineer to help you pick the right grade for your temperature zone.

1. PLAN FOR PROFIT—Texaco's newest color-and-sound movie. Dramatizes the major savings you can make with the proper investment of less than 1% of your total budget—the amount you spend on lubricants. Film features latest lubrication methods and equipment on a number of contracting projects, demonstrating the Texaco Simplified Lubrication Plan in action.

2. FUNDAMENTALS OF LUBRICATION—a brand new Texaco color slide film. A clear, concise once-over that defines technical terms like "viscosity" and explains specifically what lubrication is and what it does. This down-to-earth discussion will give the lubrication man a new understanding of the importance of lubrication, and a fresh interest in his work. It's supplemented with a manual that covers the same ground in greater detail.

3. LUBRICATION OF EARTHMOVING EQUIPMENT—a new slide film, in color. A concise, easy-to-understand analysis of proper lubrication of engines, wheel bearings, steering, track rollers, crawler treads, hydraulic equipment, wire rope, open and enclosed gears. Supplemented with a manual that covers the whole field of earthmoving equipment lubrication in greater detail.

FOR AN EARLY SHOWING of any one of these films—or all of them—contact your Texaco Contractor Representative *now*.

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Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in time and money can be made. If Lube Logic doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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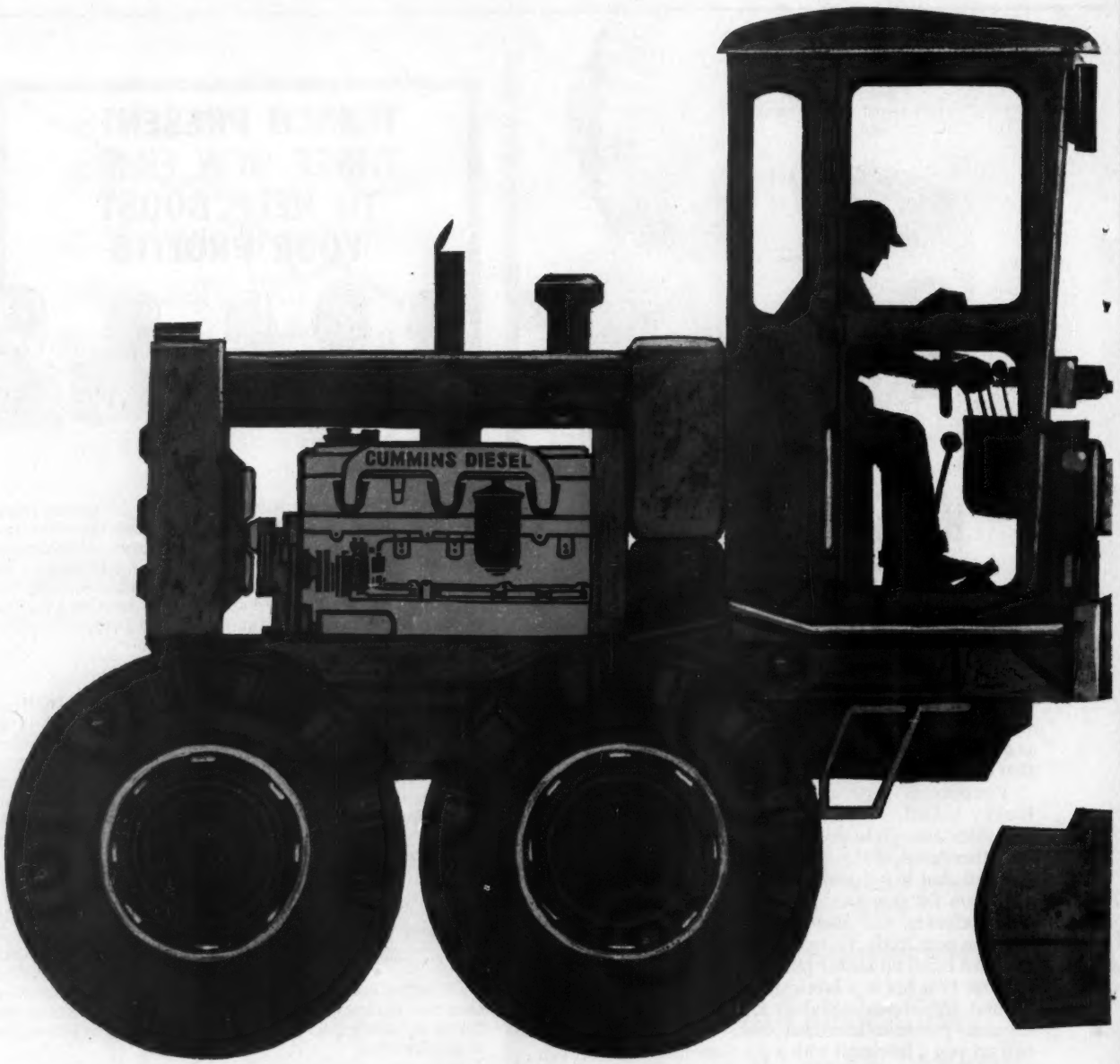

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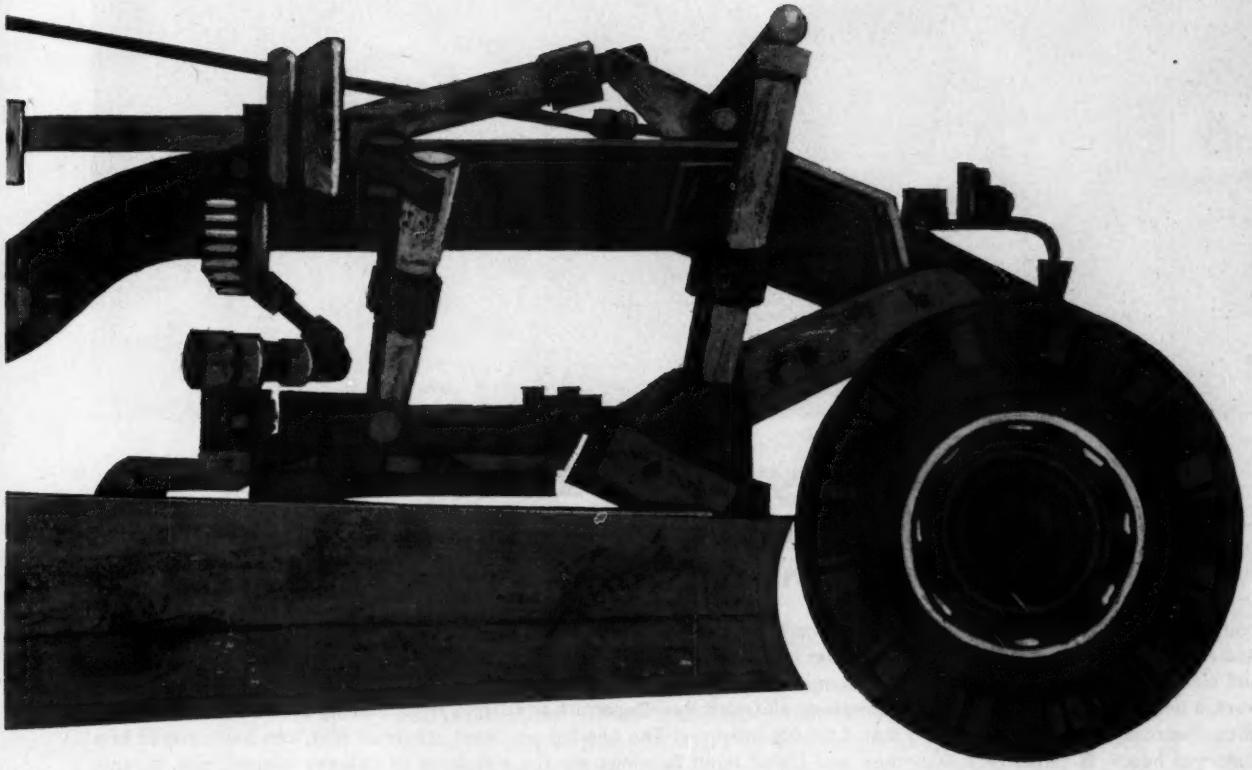
Construction equipment manufacturers offer 550 models powered by Cummins, proof of Cummins superior performance. Construction men have found Cummins Diesels are more dependable than any other form of power. You too can boost profits . . . finish jobs days ahead of schedule.



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UNITED MOTORS SERVICE, Division of General Motors

Circle 10 on Reader Service Card

Construction News From Washington

Washington, D.C.
December, 1961

Highway Funds Will Not Be Released Early

State highway departments will have to readjust future contract award schedules because of a new directive issued last month by the Bureau of Public Roads.

In a memorandum that reversed the speedup policy previously pursued, Federal Highway Administrator Rex M. Whitton notified the states that the $818 million of federal-aid funds for the third quarter of the current fiscal year would not become available until Dec. 1, instead of Nov. 15. The preceding two quarterly allotments had been released six weeks in advance of Oct. 1 and July 1.

A further setback will come in releasing the $818 million for the fourth quarter. Funds will become available March 15, only two weeks in advance of the quarter. By July 1, the cutback will be complete, with funds being released on the same day the quarter begins. BPR plans to hold to this fixed schedule of quarterly releases, making no funds available in advance, from that time on.

Curtailment of the federal speedup program will cause some slowdown in future contract awards by a number of states. When the tightened BPR schedule came out last month, more than 30 states had already held lettings that dipped into the quarterly allotment issued to them Aug. 15.

These states now have to adjust future lettings to fit the new stretchout in the issuance of federal funds.

Industrial and Trade Unions Go To Mat

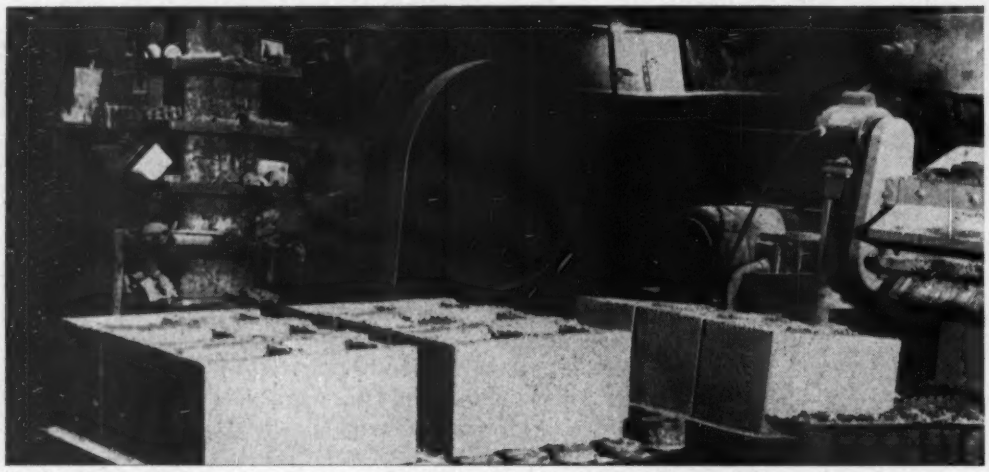
Organized labor's angry jurisdictional feuds are heading for a showdown. Walter Reuther's big Industrial Union Dept. is demanding a final solution to the recurring fights over jobs between the craft and production unions in the labor federation. The IUD will test its strength within the AFL-CIO by proposing to its national convention next month that the craft unions be checked in their move to handle plant maintenance work. Also, Reuther's unions are demanding that all jurisdictional disputes be submitted to arbitration to end them once and for all.

The proposals, which Reuther will offer in a series of resolutions to the convention, are certain to be fought by the AFL-CIO's Building Trades Dept. Their resistance to the arbitration plans is matched, at least, by their determination to pursue the construction industry-labor plan for factory maintenance by construction crews.

Unless some compromise is worked out—and this is still possible—the brewing convention fight could lead to an AFL-CIO split-up after 6 yr. Reuther calls the federation a merger "in name only."

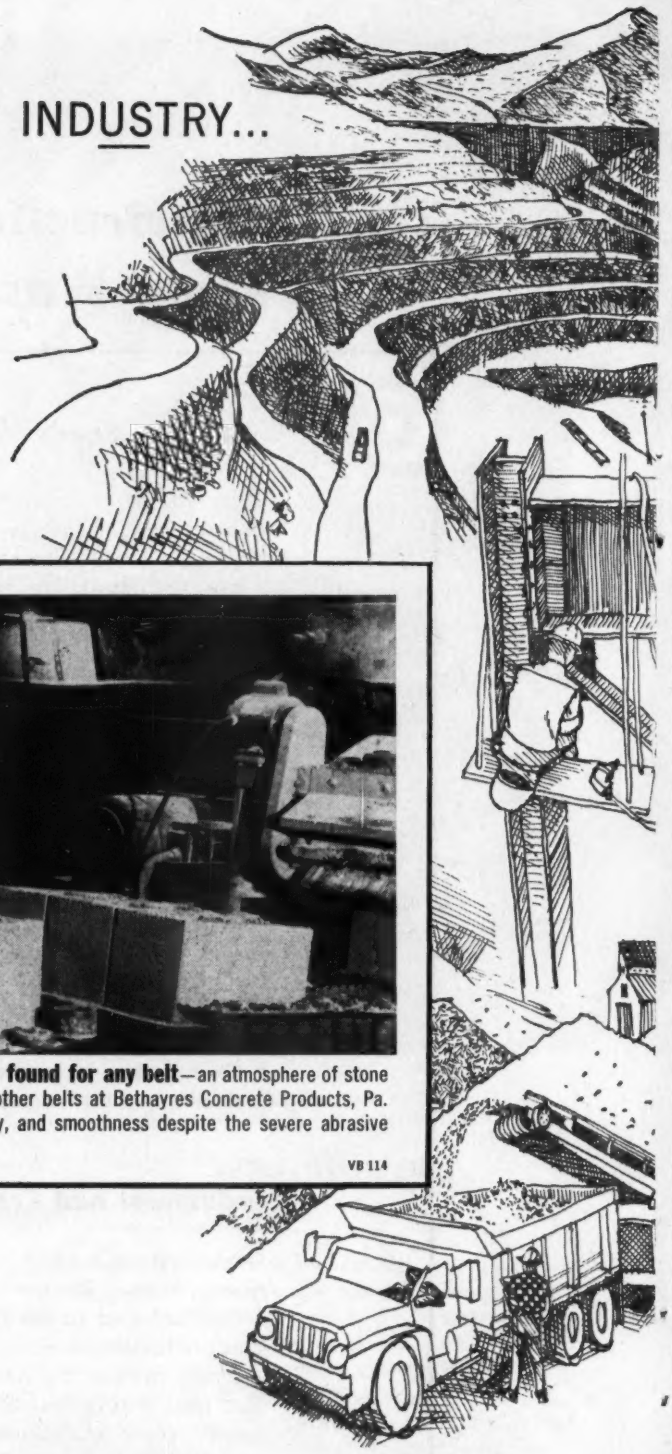
US RUBBER

AT THE HEART OF INDUSTRY...

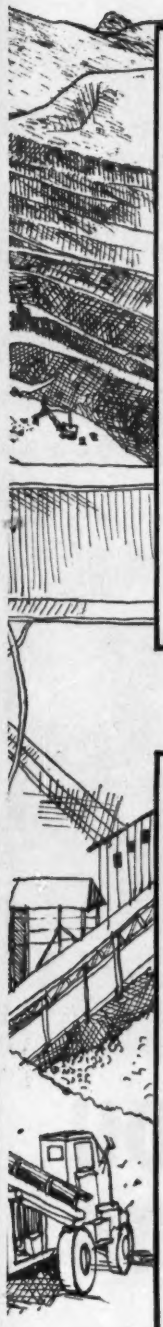


Performing perfectly under one of the toughest applications found for any belt—an atmosphere of stone dust and flying rock particles—U.S. Royal V-Belts have outlasted all other belts at Bethayres Concrete Products, Pa. These belts have demonstrated unequalled toughness, length stability, and smoothness despite the severe abrasive atmosphere in which they must perform.

VB 114



For construction and mining men across the land, US Industrial Rubber Products are helping make tough jobs easier, faster, and more profitable. Small wonder that US is the largest producer of industrial rubber products in the world.



Now US brings another major development to conveyor belting—the WeatherGard cover. In recent tests this cover was unharmed by 7 times the ozone torture that causes ordinary belt covers to crack and fail. What's more, the WeatherGard cover has much greater resistance to cracking from accelerated aging, has outstanding resistance to abrasion, wear, and weather.

CB 119

Where men and hose flex their muscles, you'll find U.S. 4810 Air Hose in the thick of the work. On the really tough jobs—where tight quarters, abrasive terrain and high working pressures take their toll of ordinary air hose—U.S. 4810 stands up to use and abuse. And despite its great strength, this hose is easy to handle, readily flexible, less expensive.

H 120

The only hose built like a tire, U.S. Royal Cord Air Hose amazed builders of a large aluminum plant in Texas by its ability to withstand abuse. Lying unprotected on a road surfaced with abrasive sea shells, the hose was continually run over by heavily loaded trucks and even 50-ton cranes—showed no damage even when carrying full working pressure.

H 108

For every industrial rubber product need, turn to US. For Conveyor Belts, V-Belts, the original PowerGrip "Timing"® Belt, Flexible Couplings, Mountings, Fenders, Hose and Packings... custom-designed rubber products of every description. Discover why U. S. Rubber has become the largest developer and producer of industrial rubber products in the world. See your U.S. Rubber Distributor or contact US directly at Rockefeller Center, New York 20, N. Y.

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

United States Rubber

MECHANICAL GOODS DIVISION

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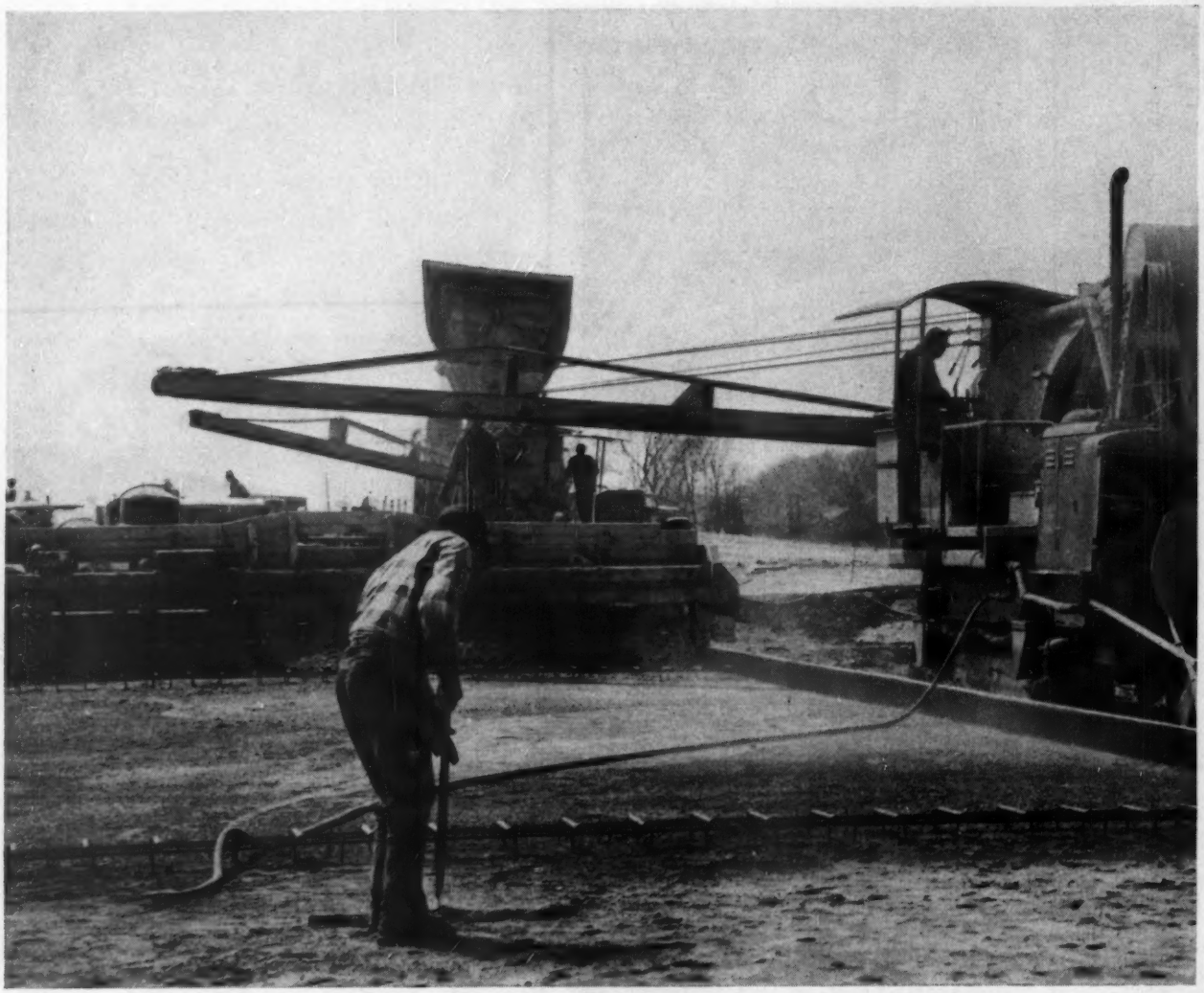
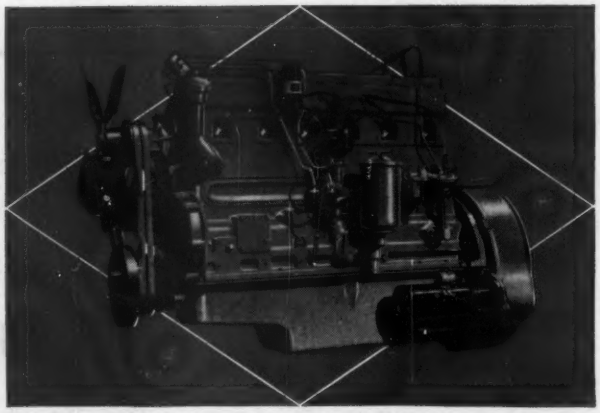


LET INTERNATIONAL GET YOU FOR SPRING-THAW CONTRACTS

Select from 4 famous INTERNATIONAL Red Diamond engines—there's one right for any construction project

One of the main reasons for INTERNATIONAL truck leadership is right under the hood. The 6-cyl., valve-in-head, high-torque design of these famous engines offers you the perfect power-range for every operation. Available in 372, 406, 450 and 501 cu. in. displacements. (Royal Red Diamond 501 shown here). See your INTERNATIONAL Dealer or Branch now and be sure of early delivery.



READY RIGHT NOW!

How to get the jump on early Spring operations:

Combine the proven power of an INTERNATIONAL Red Diamond engine with the sure traction of a rugged INTERNATIONAL tandem axle and you can stop worrying about unpredictable Spring weather. For example, they call the rugged Model RF-190, shown here, practically bog-down-proof. The broad INTERNATIONAL line of 6-wheelers is available with gasoline, diesel or LPG engines to 262 hp. GVW's from 22,000 to 73,000 lbs.

Put INTERNATIONAL designed-and-built tandem axles on your job — warranted for 100,000 miles

Gives you greater torque and load capacities—more savings in weight—less truck wear and tear! Induction-hardened axle shafts with up to 10 times more resistance to shock loads. Lightweight unit with simplified power divider and through-drive design. Shafts and other parts interchangeable between axles. Three models — in ratings of 30,000, 34,000 and 38,000 lb. capacities. International Harvester Co., Chicago, Ill.

INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE IH®

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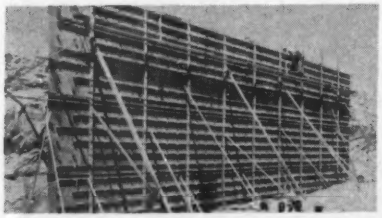
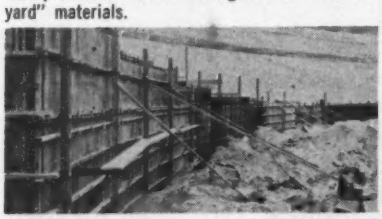
CUT CONCRETE FORMING COSTS IN HALF...

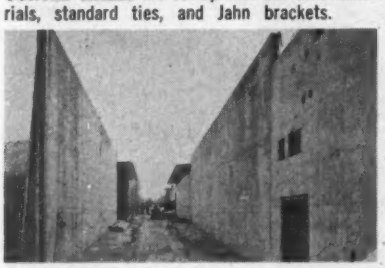
SAVE TIME, LABOR AND MATERIALS on



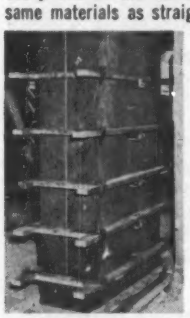
HIGH WALLS up to 32 feet high or more, are set up without nails and using standard "lumber yard" materials.



CURVED WALLS are set up with standard materials, standard ties, and Jahn brackets.



BATTERED WALLS like this are set up as easily and in the same manner and with the same materials as straight wall forms.



COLUMNS AND PILASTERS can be set up quickly with regular Jahn Forming Brackets and Waler-wedges. Standard plywood panels and 2x4 walers are the only additional material requirements.

JAHN FORMING BRACKETS make the fastest, easiest to set up forms ever developed for concrete work. Fast pouring, won't vibrate loose, easy stripping, full 3,000-lb. tie strength, and a big money-saving benefit in Time, Labor and Materials are a few of the advantages you will derive from this **low-cost,** precision forming method.

WRITE FOR COMPLETE LITERATURE AND PRICES

JAHN FORMING METHOD

6359 E. EVANS AVE. DENVER 22, COLORADO
PHONE 757-4915

Circle 16 on Reader Service Card

Job Talk...

Modified Subsoiler Rips Pavement

Adapting a farm tool for construction purposes, the E. J. Pennig Co. employs a modified subsoiler mounted on front of a wheel loader to rip up street pavement in St. Paul, Minn.

Attached to the bucket of a 140-hp Caterpillar 966 loader and pulled in reverse, the beefed-up subsoiler peels tightly embedded cedar blocks, vitrified clay bricks, granite cobblestones and 3 to 4-in. layers of hard asphalt from streets undergoing major repair. With the subsoiler removed, the loader performs normal grading and excavating tasks. The double-duty machine saves the contractor the expense of renting a crawler tractor with ripper.

Unlike a rock ripper, the subsoiler has 8-in. steel plates welded to each side to produce a flaring effect that facilitates peeling and provides a mixing, rolling action. An additional plate reinforces the lower end of the shank. Ripping depth (24 in. maximum) and angle are controlled by the 966's double-action lift and tilt cylinders.

The subsoiler is sandwiched between two 8-ft-long, U-shaped beams and is slipped onto the lower lip of the loader bucket by means of a horizontal V brace. No attempt is made to secure the sleeve to the bucket at this point in order to permit sufficient play for ripping action. Instead, the beams are pinned to a clevis welded on the rear of the bucket.

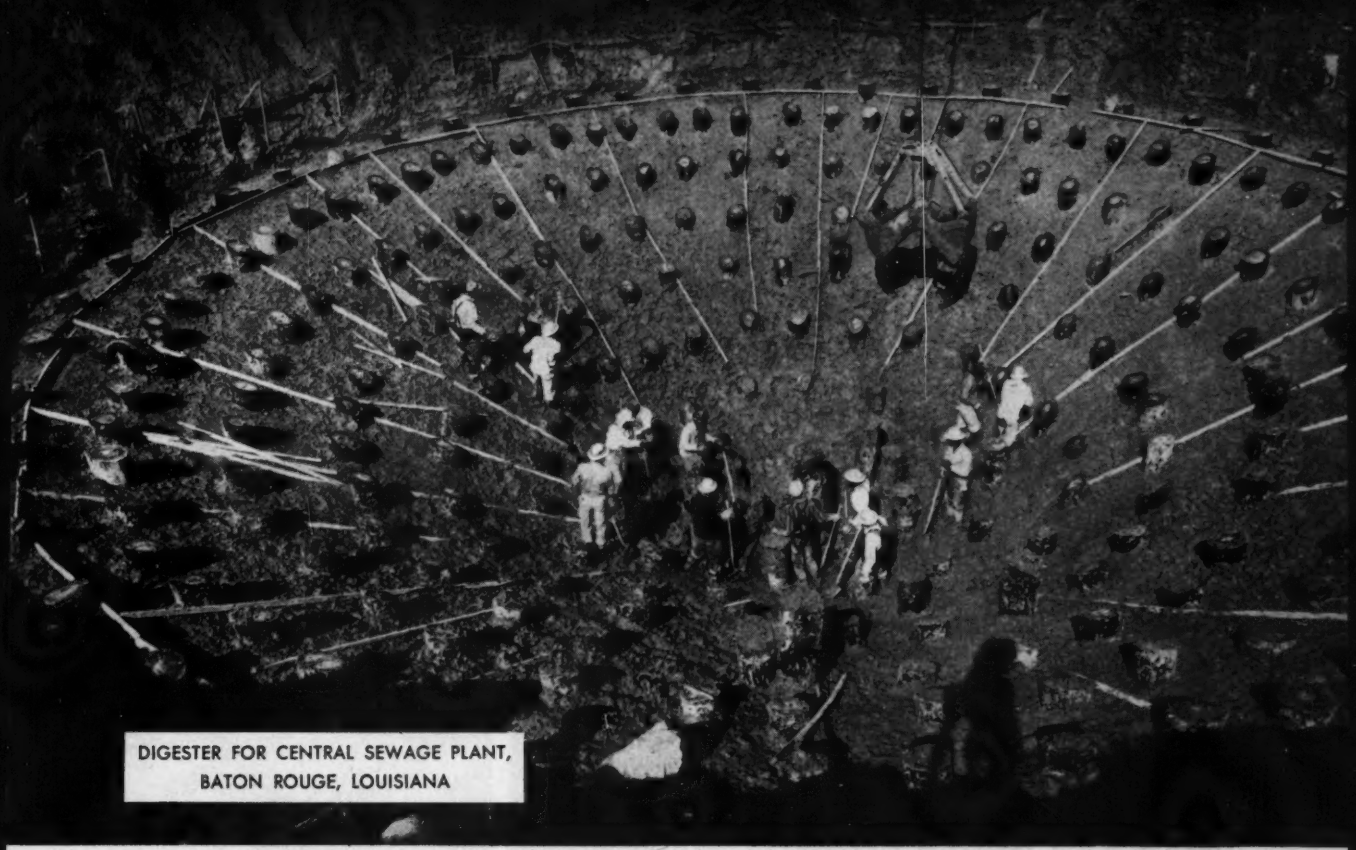
Truck-Mounted Crane Cuts Loading Time

An unusual truck-mounted crane-and-trailer combination is helping Philips Petroleum Co. reduce pipe-loading time by 50% at an oil field near Shidler, Okla.

Nicknamed "the green hornet with the yellow stinger" by the

continued on page 19

CONTROL WATER...and YOU CONTROL COSTS



DIGESTER FOR CENTRAL SEWAGE PLANT,
BATON ROUGE, LOUISIANA

Contractor: Plant Service Construction Co., Baton Rouge *Design Engineers:* Barnard and Burk, Inc., Baton Rouge

The contractor's problems on this project were varied and complicated. He had to:

1. Control from 16 to 20 feet of water in soft clay and sandy silt.
2. Maintain 60% slopes to pour the bottom cone of the digesters.
3. Protect the job from blow-ins by relieving the hydrostatic pressure of the nearby Mississippi River whose elevation changed constantly throughout the work.

He solved all problems successfully by installing a MORETRENCH WELLPOINT SYSTEM. Result—a trouble-free job.

If your problems involve WATER, call us. We can help you plan, bid, and execute wet work *at a profit.*

Catalog #1000 sent on request.

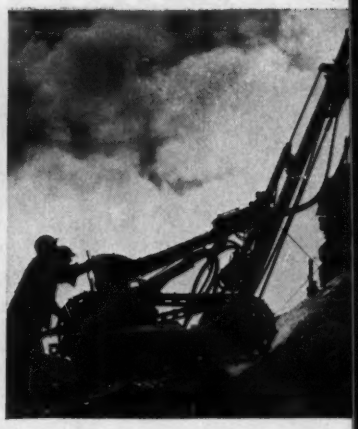
MORETRENCH CORP.

4900 S. Austin Ave. Chicago 38, Illinois POrtsmouth 7-4212	315 W. 25th St. Houston 8, Texas UNderwood 4-7774	P.O. Box 7581 Norfolk 15, Virginia NOrfolk 487-0551	4765 North Highway #8 St. Paul 12, Minnesota MElrose 3-6393	7701 Interbay Blvd. Tampa 9, Florida 831-1871
EASTERN DISTRICT OFFICE: Hackensack, N. J. HUbbard 9-7676 New York Tel.: CO 7-2283	**WESTERN REPRESENTATIVE:** Andrews Machinery of Washington, Inc. Seattle 4, Washington	**WESTERN REPRESENTATIVE:** Pacific Pumping Company Oakland 4, California	**CANADIAN REPRESENTATIVE:** Geo. W. Crothers, Limited Toronto, Ontario	**BRAZILIAN REPRESENTATIVE:** Oscar Taves & Co., Ltd. Rio de Janeiro

EXECUTIVE OFFICES AND PLANT: ROCKAWAY, NEW JERSEY

Circle 17 *on Reader Service Card*

BUILDING AN "UNBUILDABLE" RAILROAD



WITH GYRO-FLO POWERED

MOUNTAIN-GOAT CRAWL-IRs

The Quebec-Cartier Mining Company's 193-mile ore-carrying railroad from Port Cartier to Lake Jeannine in Labrador is being built over a terrain so steep and rugged as to make drilling and blasting almost impossible. Yet the work of removing 4 million yards of hard pre-cambrian rock is proceeding on schedule — thanks to the mountain-goat agility of 34 Ingersoll-Rand Crawl-IR drills and dependable Gyro-Flo portable air compressors.

Equipped with I-R utility air hoists for extra maneuverability, the powerful, fully-mechanized Crawl-IR drills climb around on rugged rock faces that are almost perpendicular.

The same outstanding performances and dependability that have proved such a big asset on this difficult project can be yours on any job, when you depend on Crawl-IR drills and Gyro-Flo compressors.

Ingersoll-Rand®

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A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

Circle 18 on Reader Service Card

JOB TALK . . .

continued from page 16

field crew, the unit consists of a modified Pitman Hydralift Model 160-B crane mounted at the rear of a cab-over-engine Mack truck. The truck pulls a lowboy on which the pipe is loaded.

Hydraulic power is utilized to drive the winch, raise and lower and telescope the boom, and set outriggers. The hydraulic pump is powered by a take-off from the truck engine.

A toggle-switch-type hydraulic control box mounted outside the truck cab is equipped with 50 ft of control hose, permitting the crane operator to move in close during pipe-handling operations.

Crawler Linkage Serves as Counterweight

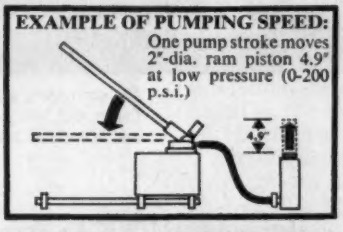
Crawler linkage nested in a tight bundle serves as a counterweight for a boom truck put together by Williams Construction Co. of Baltimore.

Consisting of the pins, bushings and rails of a crawler assembly—but not the pads—the counterweight rides outriggers welded to the frame of the truck. Chains suspended from a steel frame atop the truck cab hold the end of the outriggers. An A-frame at the rear of the truck anchors it.

The shop-built rig is now at work on a section of the Baltimore Beltway. Maintenance crews use it to handle major assemblies in the field.

An article in our April issue (p. 98) referred to "a patented method called Contact Sheeting." In fact, Contact Sheeting is not patented.

Get fast ram approach, save time with new 2-speed hydraulic pump



Pump, valving and controls mount on common cover plate; use with other reservoirs.

- **Delivers a big 7.35 cu. in. of oil per stroke at low pressure (0 to 200 p.s.i.)**
- **Delivers .294 cu. in./stroke from 200 to 10,000 p.s.i. for high force requirements**
- **For operating both single and double-acting cylinders**

Here is a compact, precision-built 10,000 p.s.i. 2-speed hand pump with the ability to deliver exceptionally high volume at low pressure for fast ram approach and return. Handle high-force requirements, yet waste no time getting the ram to the work! Choice of 2-way or 4-way control valve, mounted easily on cover plate; no exposed piping. Unit weighs only 34 lbs.

Ask your OTC distributor about the new OTC "Dualmaster" pump.

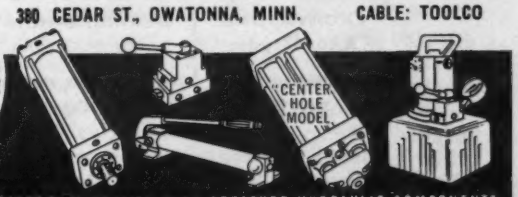
PRECISION HYDRAULICS DIVISION

OWATONNA TOOL CO.

380 CEDAR ST., OWATONNA, MINN. CABLE: TOOLCO

RESEARCH · ENGINEERING · DEVELOPMENT

OTC



DESIGNERS AND MANUFACTURERS OF QUALITY HIGH PRESSURE HYDRAULIC COMPONENTS

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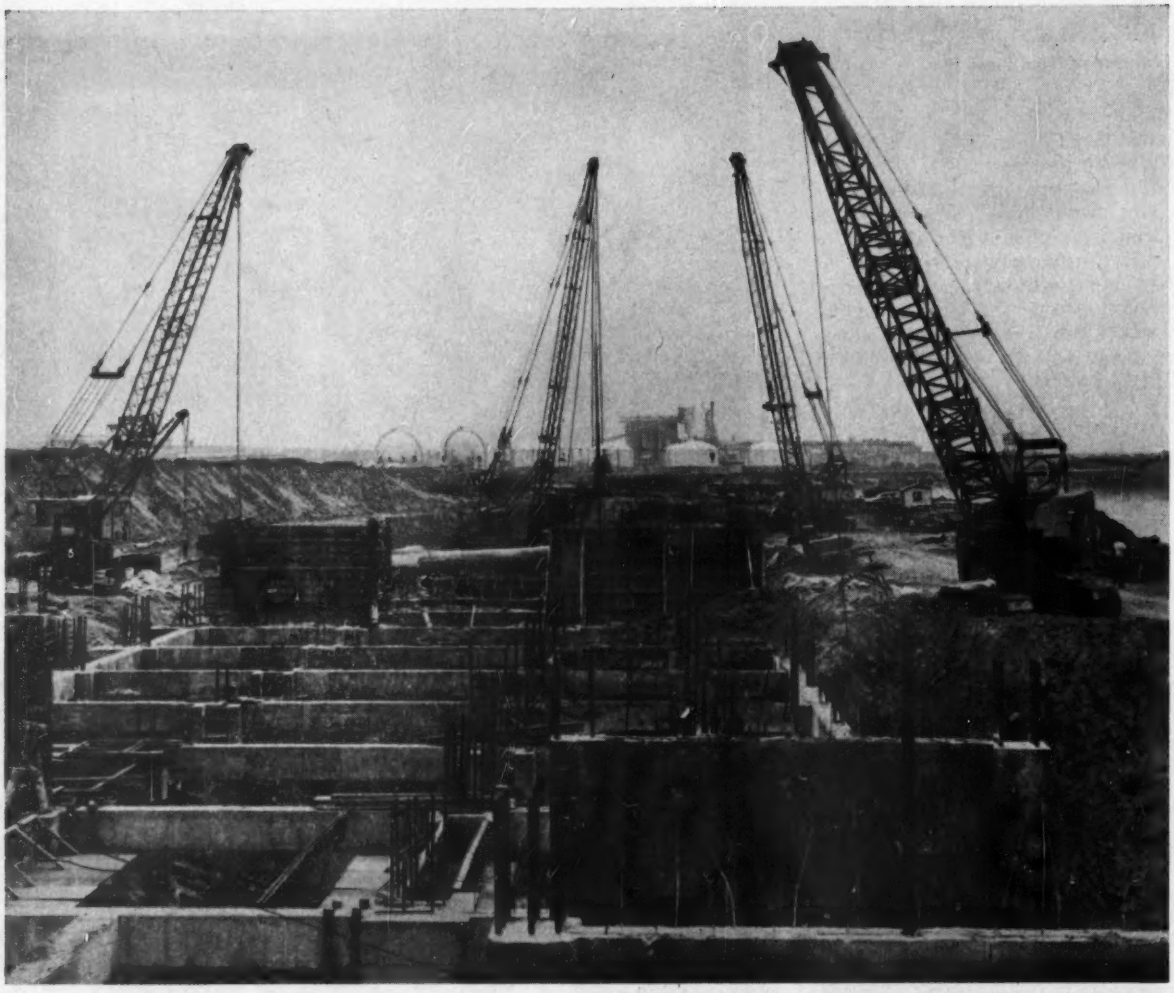

The contractors and their machines on this job are (left to right): Maxwell Constr. Co., 500 Series AMERICAN; J. C. McCullough Constr. Co., 300 Series and 700 Series AMERICANS; Kenneth Homfeld, Inc., 700 Series AMERICAN.

3 contractors, 4 AMERICANS

speed completion of new dock facilities

Here are 4 AMERICAN cranes doing a job . . . helping build 1250 feet of new dock facilities in Houston, Texas. The contractors who own these machines have the same basic aims as you — to do good work and to make money doing it.

Why their unanimous choice of AMERICANS? Because they see more profit in AMERICAN's clean, uncluttered design. Excellent control of the load. And the way AMERICANS do the job expected of them with a bare minimum of attention.

Crane values have changed a lot over the years. Take a good look at what AMERICAN offers you *today*. We think you'll see what we mean.

CC-747

EXCAVATORS ⅛ to 4½ yds.	DERRICKS-HOISTS to 800 tons	FORGED FITTINGS FOR WIRE ROPE AND CHAIN (Crosby-Laughlin Div.)
CRANES 12½ to 110 tons	REVOLVER CRANES to 400 tons	

AMERICAN

AMERICAN HOIST and DERRICK COMPANY
ST. PAUL 7, MINNESOTA

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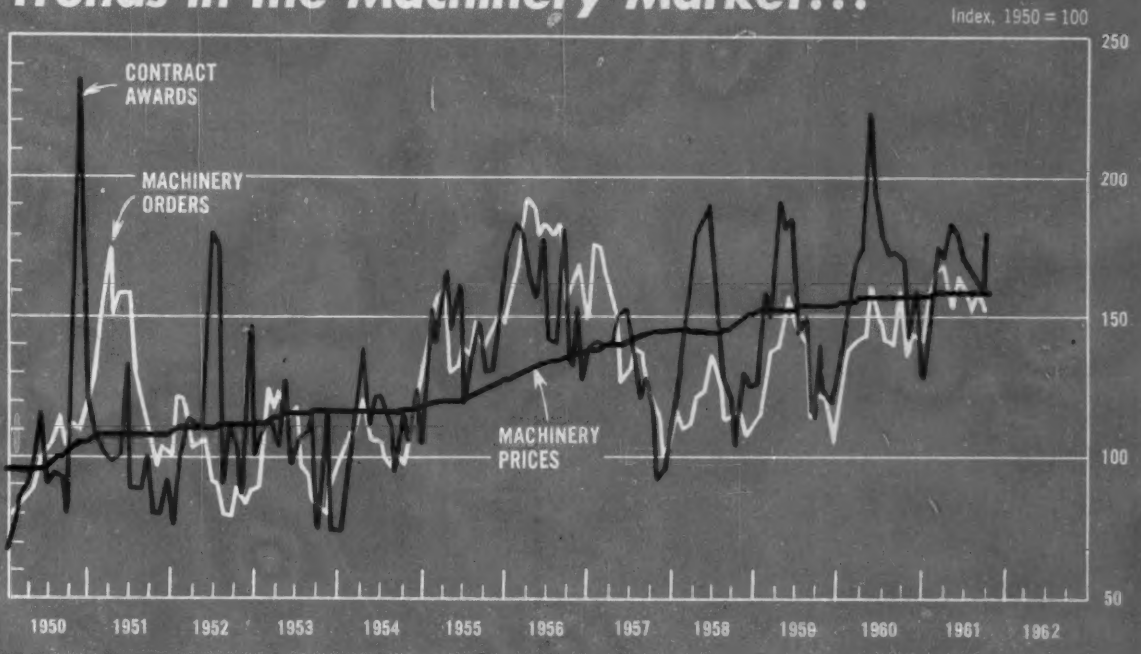
Trends in the Machinery Market...



Price Index

	OCT. 1961	MONTH AGO	YEAR AGO	% CHANGE 1960-1961
All Types of Equipment	178.5	178.5	176.7	+ 1.0
Cranes; Draglines, Shovels	173.9	177.7	173.6	+ 0.2
Shovel, ½ cu yd	173.1	173.1	167.9	+ 3.1
Shovel, ¾ cu yd	178.8	178.8	175.4	+ 1.9
Shovel, 1-1½ cu yd	191.0	191.0	189.3	+ 0.9
Shovel, 2-2½ cu yd	169.1	169.1	170.3	— 0.7
Shovel, 3-3½ cu yd	159.8	159.8	167.8	— 4.8
Shovel, 6 cu yd	201.2	201.2	197.9	+ 1.7
Crane, truck mounted	167.0	165.9	168.2	— 0.8
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	162.9	162.9	162.9	0
Bucket, dragline	169.3	169.3	169.3	0
Scrapers and Graders	165.4	165.4	166.6	— 0.8
Scraper, 4 wheel, 8-10.5 cu yd	145.3	145.3	155.0	— 6.3
Scraper, 4 wheel, 12-15 cu yd	153.3	153.3	156.8	— 2.2
Scraper, 2 wheel, 15-19.5 cu yd (a)	126.2	126.2	126.2	0
Grader, heavy duty	173.5	173.5	174.1	0.4
Grader, light and medium	170.9	170.9	170.9	0
Tractors (non-farm, incl industrial)	195.4	195.4	194.1	+ 0.7
Wheel type, off-highway (a)	127.6	127.6	129.2	— 1.3
Crawler type, 50-74 dph	207.5	207.5	203.5	+ 2.0
75-99 dph	204.8	204.8	204.3	+ 0.2
100-54 dph	200.7	200.7	199.2	+ 0.8
155-200 dph	208.6	208.6	205.4	+ 1.6
Machinery, Tractor Mounted	177.9	177.9	176.2	+ 1.0
Dozer, cable controlled	164.8	164.8	164.8	0
Dozer, hydraulic controlled	201.4	201.4	201.9	— 0.3
Cable power control unit	148.8	148.8	152.9	— 2.7
Loader, tractor shovel	166.7	166.7	163.2	+ 2.1
Specialized Machinery	159.6	159.6	158.8	+ 0.5
Ditcher	153.8	153.8	153.8	0
Roller, tandem	228.5	228.5	226.4	+ 0.9
Roller, 3 wheel	178.7	178.7	178.7	0
Ripper and rooter	164.5	164.5	164.5	0
Dewatering pump, 10 M gph	108.5	108.5	111.5	— 2.7
Dewatering pump, 90 M gph	156.1	156.1	151.5	+ 3.0
Portable Air Compressors	181.5	181.5	167.5	+ 8.4
Contractor's Air Tools	190.5	190.5	181.6	+ 4.9
Mixers, Pavers, Spreaders	164.2	164.2	158.0	+ 3.9
Mixer, portable, 11 cu ft	172.5	172.5	166.6	+ 3.5
Mixer, portable, 16 cu ft	175.8	175.8	172.7	+ 1.8
Mixer, truck, 6 cu yd	131.1	131.1	135.1	— 3.0
Mixer, paving, 34 cu ft	192.9	192.9	196.7	— 1.9
Concrete finisher & spreader	209.6	209.6	173.5	+20.8
Bituminous distributor	124.5	124.5	126.2	— 1.3
Bituminous spreader	179.4	179.4	179.4	0
Bituminous paver	170.9	170.9	165.6	+ 3.2
Off-Highway Trucks, Wagons (b)	102.3	102.3	102.5	— 0.2
Contractors off-highway truck (b)	102.0	102.0	102.0	0
Trailer dump wagon (b)	104.5	104.5	106.7	— 2.1

• (a) January, 1955 = 100 • (b) January, 1958 = 100 *Revised
BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49 = 100

Equipment Orders Slip, Contract Awards Turn Up

NEW ORDERS for construction equipment in September declined to a low for the year, according to the McGraw-Hill Economics Dept. index. The dip pulled the index down 5% from August to 151, based on the average monthly dollar volume in 1950 as 100. The index was 5% below September '60.

Although orders dropped below their year-ago point for the first time in 14 mo, the 9-mo average held on to a 9% lead over the same period in 1960. But 1961 is 10% behind 1956's record average for this index, which represents the flow of orders from equipment distributors.

Heavy construction contractors' new business in October pulled out of the August-September slump. The contract award index jumped close to June's high for the year—182 compared to 186—and topped October of '60 by 4%. For the first 10 mo, however, 1961 contract volume remained slightly behind '60.

There were few changes in list prices for new equipment between Sept. 15 and Oct. 15. The Bureau of Labor Statistics price index remained at its record high of 178.5, based on average prices during 1947-49 as 100. BLS's only increase is in its truck-mounted crane price index, which still remains slightly below a year ago.

The over-all price index for Oct. 15 was only 1% higher than a year earlier. Price reductions for many items offset much of the effect of scattered price increases during the last 12-mo period.

The outlook for 1962 is keyed to what happens to steel prices. No steel price hike probably would mean no significant construction equipment price climbs.

Contracting & Material Company

"AC Oil Filters give us lower operating and inventory costs, and we use them exclusively. We also use AC Spark Plugs on much of our equipment because of their excellent economy."

DONALD P. CAGNEY
General Manager, Equipment
Contracting & Material Co.
Wheeling, Illinois

Contracting & Material Company is one of the Midwest's largest builders of highways, highway electrical installations and pipelines. Among its accomplishments is the Edens Expressway—Chicago's main line to the north—complete to the last culvert and conduit.

To do this job and others similarly complex, Contracting & Material Company employs equipment that ranges from lightweight gasoline generators and compressors to giant diesel-powered earth movers and cranes. For protection of engine oil against heavy concentrations of dirt, dust and grit,

money-saving

gets 1 ACtion with

AC

C & M has found that AC Oil Filters give best results at *lowest cost*—and specifies them for every piece of motorized equipment. What's more, Contracting & Material Company has found that the AC Spark Plugs used in many units cut maintenance costs and reduce unscheduled downtime.

AC Spark Plugs and Oil Filters will perform with equal money-saving efficiency in your operation. Call your AC Supplier and get full details on AC ACtion. Remember, you get AC quality only under the AC name.

AC SPARK PLUG ⚛ THE ELECTRONICS DIVISION OF GENERAL MOTORS

FIRE-RING
SPARK PLUGS

TRIPLE-TRAPPER
OIL FILTERS

Look for Public Works Boom

IF THE FEDERAL government follows through with its present plans, contractors should be prepared to take on a sharply increased record volume of public works contracts.

Right now, there's more money earmarked for federal construction projects and for federal assistance to local public works contracting agencies than ever before.

The Administration requested, and Congress appropriated, record sums for construction in fiscal '62. The Congress also authorized huge increases in future appropriations for major loan programs designed to spur college housing, local public works of all types, rural electrification and telephone projects (see tables).

Since fiscal 1962 began July 1, there's been no apparent increase in federal construction contracts. In fact, contract volume in the 21 weeks through November 24 was trailing last year by 3%. This wiped out the first half's gain and put this year's 47-weeks federal awards total 1% under the 1960 figure.

As we went to press, November's weekly pace was averaging less than half as much as a year ago and also was far less than November 1959. If federal contracting agencies are going to use in fiscal '62 the big increase in construction appropriations (see table), there will have to be a sharp increase in awards early next year.

And there's every reason to expect state and local contracting for waterworks, sewerage, highways, and bridges to take another healthy jump next year, partly financed by the increased amount of federal-aid grants and the low-interest loans becoming available. These funds are a sure bet to lift total public works, even if the administration in Washington trims sail on federal construction contracting plans.

Construction Methods forecasts increases of 15% and 10%, re-

Federal Appropriations for Construction

TYPE OF CONSTRUCTION	Agency	Fiscal Year Ending June 30 1962	1961	1960	Change '61-'62 %
		(Millions of dollars)			
TOTAL APPROPRIATIONS		7,007.7	6,259.5	6,421.2	+12
WATERWORKS		38.1	23.3	7.1	+64
Water supply & pollution control	PHS	20.3	12.1	0	+69
Desalting plants	OSW	4.6	2.0	1.9	+123
International Boundary & Water Comm.	STA	13.2	9.2	5.2	+43
SEWAGE					
Sewage treatment plant grants	PHS	80.0	46.1	45.0	+74
HIGHWAYS AND BRIDGES		3,059.0	2,747.8	3,091.2	+11
Federal aid to state highway depts.	BPR	2,990.6	2,685.7	3,028.0	+11
Forest highways	BPR	27.4	27.0	30.0	+1
Forest roads and trails	AGR	35.0	30.0	28.0	+17
Public lands highways	BPR	3.0	2.7	4.0	+11
Access roads	AGR, BLM	2.0	1.4	1.2	+43
Rama Road, Nicaragua	STA	1.0	1.0	0	0
EARTHWORK—DAMS—WATERWAYS		1,113.6	1,137.3	1,000.7	-2
Rivers, harbors & flood control	CE	797.0	832.7	730.5	-4
Construction, general		724.0	760.8	661.4	-5
Flood control, Mississippi River		73.0	71.9	69.1	+1
Reclamation	BR	207.9	228.1	207.0	-9
Construction & rehabilitation		152.4	166.7	132.5	-9
Upper Colorado River Basin Fund		55.5	61.4	74.5	-10
Flood control	SCS	25.0	19.8	18.0	+27
Watershed protection	SCS	53.8	36.7	22.8	+46
Bonneville Power Administration		28.9	18.7	21.5	+11
Southwestern Power Administration		1.0	1.3	0.9	-28
BUILDINGS		868.3	943.0	681.6	-8
Atomic energy plants	AEC	195.4	212.8	262.5	-8
Capitol	CA	7.5	21.2	19.0	-65
Courts, offices, etc.	GSA	188.9	165.4	0	+14
Federal Office Bldg. No. 7, D.C.		23.7	0	0	....
Hospitals		288.4	266.2	218.2	+8
Grants to local hospitals	PHS	211.5	186.2	186.2	+14
St. Elizabeth's Hospital, D.C.	PHS	0.6	5.0	0.3	-88
Veterans Administration	VA	76.3	75.0	31.7	+2
Prisons and facilities	JUS	2.1	9.9	0	-79
Research facilities		91.8	72.7	32.1	+26
Cancer research	PHS	5.0	5.0	0	0
Health research	PHS	30.0	30.0	30.0	0
Hospital research	PHS	10.0	0	0	....
Mental health-neurology research	PHS	0	12.1	0	-100
Food and Drug Admin. laboratory		1.8	0.1	0	+1650
National Bureau of Standards		45.0	25.5	2.1	+76
Schools		60.5	67.6	62.3	-11
Assistance to federally-impacted areas	OE	54.9	63.4	61.1	-13
Gallaudet College, D.C.		0.6	2.5	0.3	-76
Howard University, D.C.		5.0	1.7	0.9	+202
Other Buildings		33.7	127.2	87.5	-53
Indian health facilities	PHS	8.3	9.7	4.8	-15
Office of Civil & Defense Mobiliz.		2.5	0	2.4	....
Public Health Service		18.2	3.5	0.3	+425
Smithsonian Institution		4.7	13.5	0	-65
State Dept.	STA	0	0.5	0	-100
Post office modernization	GSA	0	100.0	80.0	-100
AIRPORT AND SPACE PROGRAM PROJECTS		489.3	207.3	143.8	+136
Airports	FAA	244.3	84.5	70.0	+189
Grants-in-aid to airports		220.0(a)	80.0	47.5	+175
Washington National Airport		4.2	4.5	22.5	-7
Additional Washington airport		20.1	0	0	....
Space projects—plants, test facilities	NASA	245.0	122.8	73.0	+100
MILITARY PROJECTS	CE, BYD	951.7	994.9	1,340.4	-4
In the U.S.		820.4	847.9	n.a.	-3
Outside the U.S.		131.3	147.0	n.a.	-11
OTHER FEDERAL CONSTRUCTION PROJECTS		407.7	159.8	147.4	+155
Civil Defense fallout shelters (b)		207.6	0	0	....

(a) Includes $75 mil. for fiscal '63 (b) Includes money for vehicles

AEC—Atomic Energy Comm.
AGR—Dept. of Agriculture
BLM—Bu. of Land Management
BPR—Bu. of Public Roads
BR—Bu. of Reclamation
BYD—Bu. of Yards & Docks
CA—Capitol Architect
CE—Corps of Engineers
FAA—Fed. Aviation Agency
GSA—Gen'l Services Admin.
JUS—Justice Dept.
NASA—Nat'l Aero. & Space Ag.
OE—Office of Education
OSW—Off. of Saline Water
PHS—Pub. Health Service
SCS—Soil Conservation Serv.
STA—State Dept.
VA—Veterans Admin.

Before you buy any small scraper . . .

see what the "EUC" S-7 can do on your work

In small scrapers, dependable performance, service accessibility and low cost production are just as important as in the big machines used on multi-million yard projects. The Model S-7 Euclid Scraper has proved its reliable and economical productive capacity on scores of jobs . . . and on all kinds of work.

Powered by a 148 h.p. GM engine with Torqmatic Drive, the S-7 carries a heaped load of 9 cu. yds. (7 yds. struck) at speeds up to 23 mph. Full-power shift cuts down the work cycle and simplifies operation. Hydraulic lever action gives fast, independent control of bowl, apron and ejector. Accessibility for servicing is unmatched by any other scraper. We think you'll find the S-7 is your best buy in its class.

GM GENERAL MOTORS EUCLID

EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

No Downtime in Over 3000 Hours

Mr. L. F. Robertson, Robertson Construction, Ltd., Saskatchewan, reports, "Our two LW Model D Tandems really move the dirt. The older of the pair has logged over 4500 hours with no downtime. At 2900 hours we pulled the Fuller 5-G-720 Transmission out and opened it, and found it in perfect condition.

"I specify Fuller Transmissions, because I know I can depend on them. The 5-speed Fuller in my Model D LW's has proven to be completely reliable while providing ideal ratios on the job as well as over the road. When we move, we simply hitch our trailers and low-boys to the back of the D-Pulls and move out.

"In all, I operate six LeTourneau-Westinghouse Model D Tournapull Scrapers equipped with Fuller Model 5-G-720 Transmissions, and I've found that for performance and availability, they can't be beat."

For the right transmission ... for your operation, Specify the Model, Specify FULLER

FULLER TRANSMISSION DIVISION

EATON MANUFACTURING COMPANY

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Circle 25 on Reader Service Card

Circle 26 on Reader Service Card

Federal Loans, Grants for Non-Federal Projects

	Agency	Fiscal Year 1962 (Millions of $)	1961	Chg. %
TOTAL LOAN & GRANT FUNDS		3,494.4	2,665.3	+31
FOR LOCAL PUBLIC WORKS		322.3	171.6	+88
Area redevelopment grants	ARA-HHFA	40.0	0	....
Water distribution facilities	BR	13.3	11.6	+14
Mass transportation	HHFA	42.5	0	....
Public works planning advances	HHFA	7.0	6.0	+17
Urban planning grants	HHFA	17.1	4.0	+328
Public facility loans	HHFA	(500.0c)	0	....
Urban renewal grants (b)	HHFA	200.0	150.0	+33
Urban studies, housing research	HHFA	0.4	0	....
Low-income housing demonstration projects	HHFA	2.0	0	....
FOR PRIVATE PROJECTS		182.5	20.0	+813
Area redevelopment loans, grants (a)	ARA-HHFA	122.5	0	0
Housing for the elderly loans	HHFA	60.0	20.0	+200
Rural electrification loans (a)	REA	(407.5c)	(310.0c)	+31
To electric co-ops		(245.0c)	(170.0c)	+44
To telephone co-ops		(162.5c)	(140.0c)	+16
College housing loans	HHFA	(300.0cde)	0	....
TO OTHER COUNTRIES (a)		2,989.6	2,472.7	+21
Inter-American Development Bank	T	110.0	(f)	....
International Development Assn.	T	61.6	73.7	−16
Foreign Assistance	E	1,409.0	1,200.0	17
Chilean reconstruction & rehab.		0	100.0	−100
Development grants		296.5	0	....
Development loans		1,112.5	600.0	+85
Inter-American Social & Economic Cooperation ("Alliance for Progress")		0	500.0	−100

(a) Construction gets a part of the total not included in totals. (b) For land cost (c) New additional authorization, (d) Some loans to public institutions (e) Plus $300 million per yr for fiscal years '63, '64, '65.

KEY TO AGENCIES: ARA—Area Redevelopment Admin. HHFA—Housing & Home Finance Ag. BR—Bu. of Reclamation REA—Rural Electrification Admin. E—Executive Dept. T—Treasury Dept.

spectively in 1962 contract volume for federal construction and state and local public works. Federal volume is expected to hit a record $3.2 billion, while state and local government contracts should rack up almost $10 billion, also a new high.

Awards should increase next year in all major categories of public works. New highs are probable for waterworks (up 13%), sewage (up 8%), and highways (up 6%). Earthwork-dams-waterway volume should rack up the biggest gain in the public works sector, 21%, due mainly to increasing federal awards and additional phases of California's Feather River project. The Corps of Engineers and Bureau of Reclamation will start 83 new water resource development and reclamation projects in fiscal '62.

The National Aeronautics & Space Agency will become a much bigger buyer of new construction next year as it moves quickly to put America ahead in the space race with the Russians. Including missile bases, space programs should soon become a top construction market, buying at the rate of close to $1 billion annually.

President Kennedy's admonition in late October to federal department and agency heads that they administer their spending programs in a "careful and frugal" manner doesn't mean any cutback in spending, Washington observers say. Space program spending will nearly double; outlays for water resource development and reclamation will rise $110 million to $1.5 billion; housing and community development programs will spend $350 million more in fiscal '62 than in fiscal '61; military construction spending, including missile bases, will hold at fiscal '61's pace of $1.22 billion.

The only indication to date of go-slow sentiment that could affect construction men is the slight reining-in on federal highway aid. *(see Washington column, p. 11)*. Since the start of fiscal 1961, the quarterly portions of the highway aid appropriations had been made available some six weeks in advance. This was primarily an anti-recession measure used by both the Eisenhower and Kennedy administrations. But the Kennedy Administration has cut this advance to four weeks for the quarter starting January 1 and will cut it to only two weeks for the quarter starting next April 1.

Contracts Awarded on next page

NEED FAST DELIVERY on FINE CASTINGS

(WE HAVE 15,000 PATTERNS READY)

NEENAH FOUNDRY COMPANY
NEENAH • WISCONSIN
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SOME BIG CONTRACT AWARDS OF THE MONTH

B. F. Diamond Construction Co., Savannah, Ga., General cargo terminal, Norfolk, Va. Virginia State Ports Authority, Norfolk. $13.3 million.

Allied Structural Steel Co., Chicago, Ill. Bridge superstructure over Ohio River, Louisville, Ky., to Jeffersonville, Ind. Commonwealth of Kentucky, Dept. of Highways, Frankfort. $6,825,640.

Malan Construction Co., New York. Belmont filter plant rehabilitation, Philadelphia. Dept. of Procurement, Philadelphia. $8,939,219.

L. A. Dixon Co., San Gabriel, Calif. Processing plant, Selma, Calif. Sun Maid Raisin Growers of California, Fresno. $6,052,000.

Tully & DiNapoli, Inc., Corona, N.Y. Interstate Rt. Conn. 515 to Whitestone Expressway, Queens County, N.Y. New York State Dept. of Public Works, Albany. $8,651,405.

Gull Contracting Co. Inc., Flushing, N.Y. Grand Central Parkway, Sec. 1, Contract 1, Queens County, N.Y. New York State Dept of Public Works, Albany. $9,995,813.

Slattery Contracting Co., Inc., Maspeth, N.Y. Narrows Bridge Staten Island approach and plaza, New York. Triborough Bridge & Tunnel Authority, Randall's Island, N.Y. $8,522,869.

Haas & Haynie Corp., San Francisco, Calif. Ten-story apartments Palo Alto, Calif. Palo Alto Medical Research Foundation. $6 million.

Arthur A. Kober Co., Bala Cynwyd, Pa. Twenty-story motel, Philadelphia, Pa. Carheart, Corp., c/o Charles Luckman Associates, New York. $5 million.

Chicago High Rise Corp., Chicago. Apartment and office, Chicago. Michigan Terrace Corp., Chicago. Estimated cost: $8 million.

Johnson, Drake & Piper, Inc., New York. Van Wyck Expressway extension, Contract 2, Queens, N.Y. New York State Dept. of Public Works, Albany. $11,097,756.

Guy H. James Construction Co., Oklahoma City, Okla., and **J. H. Beckman Construction Co.**, Sioux Falls, SD. Wilson Dam and outlet works, Kansas Corps of Engineers, Kansas City, Mo. $7,531,000.

Glenwal Co., Montvale, N.J. Warehouse, Englewood, NJ. Englewood Industrial Park, Inc. Estimated cost: $3 million.

R. K. and A. Jones, Inc., St. Louis, Mo. Motel, Convington, Ky. Holiday Inn Motel, Inc, Springfield. Mo. $4 million.

Robert McKee General Contractor, Inc., Dallas, Tex. Apartment, 247 units, Louisville, Ky. F. W. Drybrough, Louisville $4,770,000.

Panama, Inc., Houston, Tex. Gas line Houma to Bohemia La. United Gas Pipeline Co., Shreveport, La. $3,835,000.

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Platform Trailers
check first with TRAILMOBILE
Trailmobile offers you a complete line of platform trailers for distributed or concentrated loads. Interchangeable side panels also available for conversion to open top trailers. A variety of financing plans to meet your conditions. Sales and service branches in fifty-four cities. For complete information, call the Trailmobile office nearest you or use the coupon.
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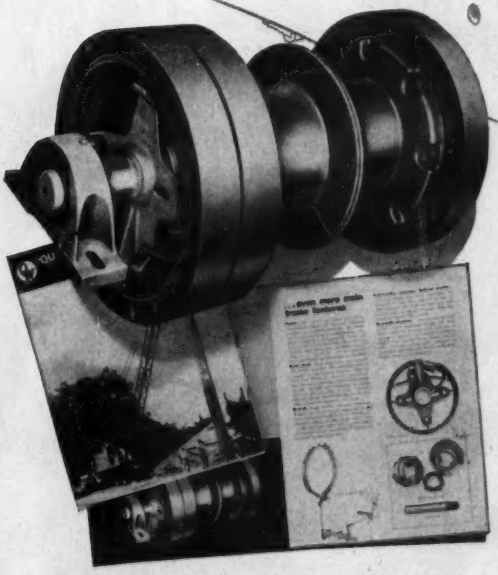


You can pull a hoist shaft in less time than it takes to read the new "Quick-Way" bulletin (That's why we call them "Quick-Ways")

The new "Quick-Way's" amazing simplicity of design lets you replace the hoist shaft — or any power shaft — in far less time. How? All shafts have involute splines and are mounted by snap rings. Remove the ring, remove the shaft.

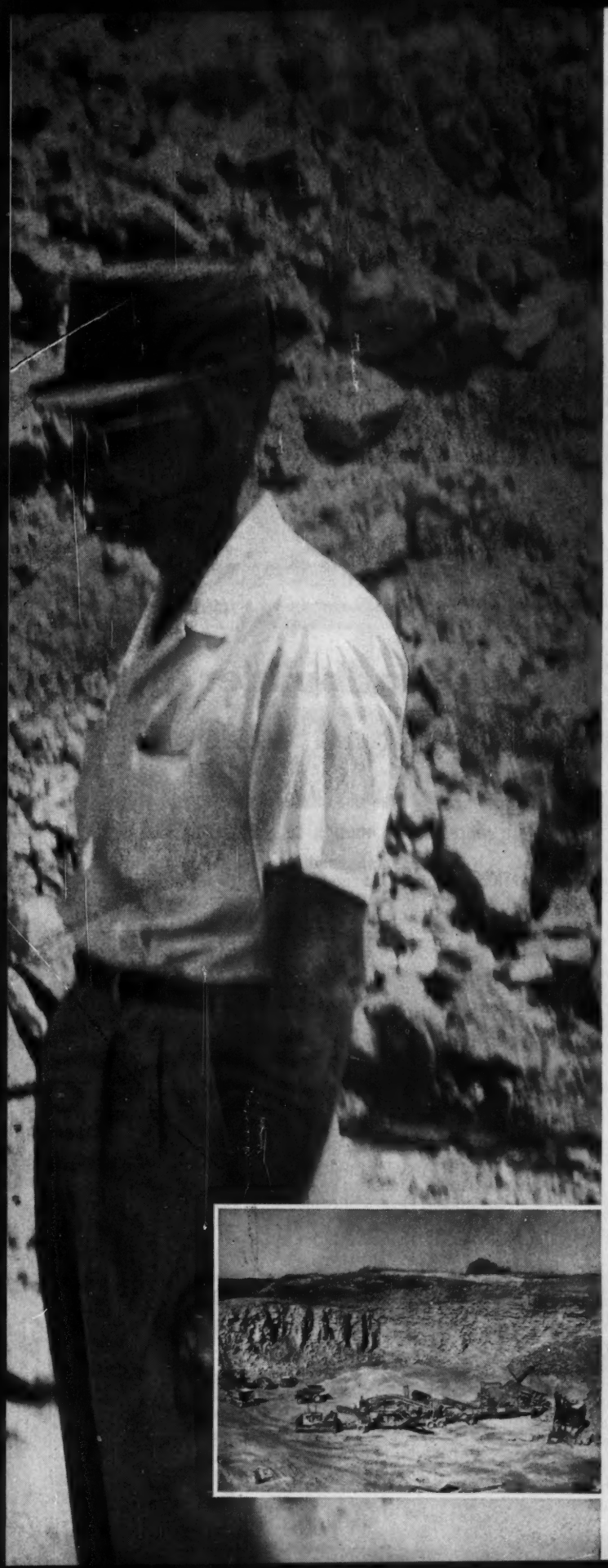
This is just one of the many ways the new "Quick-Ways" save you money. You save on initial cost. You save on operating costs. You save on downtime. You save on replacement parts cost. A large order? Yes. Prove it. Write for the new "Quick-Way" bulletin. It tells you all about rubber tire models from 15 to 25-ton capacity, and how you can save money — a lot of money. It also tells you how you can **make** a lot of money with "Quick-Way."

"QUICK-WAY" CRANE-SHOVEL COMPANY
2401 East 40th Avenue • Denver, Colorado

"Quick-Way" Crane-Shovel and Marion Power Shovel are Divisions of Universal Marion Corporation . . . "Quick-Way" ⅜ to 1 cubic yard excavators and 8½ to 25 ton cranes. Marion ¾ to 115 cubic yard excavators and 21 to 62 ton cranes.

Circle 29 on Reader Service Card

This is
AMERICAN OIL COMPANY
in action



Why this bearing runs cooler with AMOCO Lithium Grease is explained by American Oil representative Harold Jansen to Raid Brothers' superintendent Kenneth Pearson and partner Melvin Raid.

Result of first experience with American Oil Company service—down-time reduced

BY HAROLD JANSEN

About the Author. Harold Jansen has eleven years' experience giving lubrication technical assistance to customers. He has a degree in engineering to qualify him for such work in addition to having graduated from the Company's Sales Engineering School.

★ ★ ★

Bearings were running hot in the rock-crushing equipment at Raid Brothers aggregate plant, Denmark, Iowa. This reduced the speed at which the equipment could operate.

Our lubrication specialist who called on this account before me recommended a switch to AMOCO Lithium Grease. The grease reduced bearing temperatures, got the bearings running smoothly, upped operating speeds and plant efficiency and cut down-time. The success with this grease, and with the technical assistance we were able to render here, resulted in Raid Brothers converting their entire plant, including automotive equipment, to American Oil products.

★ ★ ★

You can get this kind of technical help and performance improvement from your equipment. Just call the American Oil Company office near you.

***Quick facts about* AMOCO Lithium Grease**

- Capable of providing superior lubrication over a wide range of conditions.
- Water resistant.
- High temperature resistant.
- Pumpable in grease gun or pressure system.
- Mechanically stable.

AMERICAN

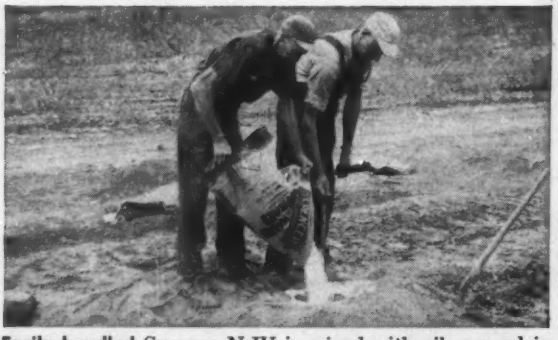
AMERICAN OIL COMPANY

910 SOUTH MICHIGAN AVENUE
CHICAGO 80, ILLINOIS

Circle **31** *on Reader Service Card*

This 280-foot culvert will be covered in jig time by that small overhanging hill. Contractor Mitchell uses a half pound of Spencer N-IV/fuel oil mixture to move a cubic yard—and cut blasting costs to the bone.

Spencer AN/FO helps roadbuilder knock down mountains and costs



Easily handled Spencer N-IV is mixed with oil, poured in blast hole, and set off with one strand of 175-grain detonating cord. No need to ever store explosives on the job.

The completed road after the final cut has been made. When paved, it will become part of Alabama's state highway network.

Spencer N-IV/fuel oil mixture blasts mountains into pieces small enough to haul away like dirt

THIS is a 9½ mile state road being cut through rugged mountain country in northwest Alabama's Franklin County. General Contractor Clyde Mitchell has had to cut down mountains and fill valleys in order to get the job done. For economy as well as efficiency, he selected Spencer N-IV/fuel oil mixture as his blasting agent.

Explaining why he uses Spencer N-IV/fuel oil mixtures for blasting, Contractor Mitchell pointed out that it is cheaper than dynamite, and does such a fine job of pulverizing overburden that his trucks can simply haul it away like so much dirt.

The special prill structure of Spencer N-IV enables it to absorb oil more evenly than any other ammonium nitrate compound. This results in a compound uniformity that adds substantially to savings. And AN/FO using Spencer N-IV doesn't require special handling. A single strand of 175-grain detonating cord will set it off when you're ready. Conventional priming methods using high intensity boosters such as Spenite* are also suitable. You never need store dangerous high explosives at the job site.

To get all the facts about Spencer N-IV Ammonium Nitrate, write Spencer Chemical Company, Industrial Chemicals Division, 407 Dwight Building, Kansas City 5, Missouri.

*A registered trademark of Spencer Chemical Company

SPENCER CHEMICAL COMPANY

SPENCER®

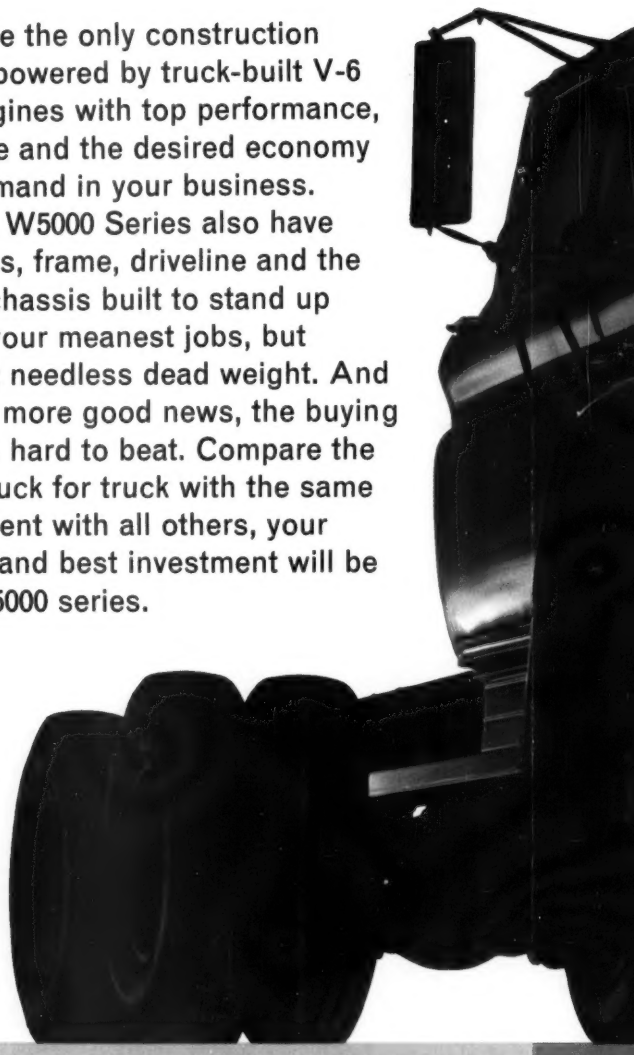
Dwight Bldg., Kansas City 5, Mo.

Circle 32 on Reader Service Card

BUILT-IN BONUSES IN GMC W5000 SIX-WHEELERS

EXCLUSIVE V-6 POWER ...PROVED DURABILITY ...LOW PRICE!

Here are the only construction trucks powered by truck-built V-6 gas engines with top performance, long life and the desired economy you demand in your business. GMC's W5000 Series also have tandems, frame, driveline and the entire chassis built to stand up under your meanest jobs, but without needless dead weight. And here is more good news, the buying price is hard to beat. Compare the cost, truck for truck with the same equipment with all others, your choice and best investment will be this W5000 series.



ONLY GMC V-6 ENGINES GIVE YOU ALL THESE ADVANTAGES

- **Top usable power over a broad range at low rpm for highest performance, lower fuel costs and longest life.**
- **Up to 176 gallons of coolant circulating every minute, up to 3 times more volume than other engines, for greatly extended life.**
- **Complete engine is designed to reduce maintenance. Example—spark plugs last up to 3 times longer than others.**
- **Bearing area is up to 60% greater than in other engines in its class.**
- **Cooler-running, bigger and stronger valves minimize costly failures.**

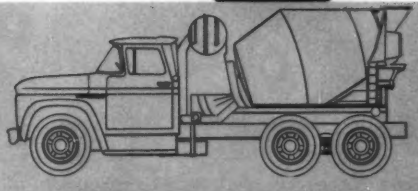
GVW
GCW
AXLE
BRAK
ENGI
TRAN

HERE ARE THE QUICK FACTS ON THE SUPERIOR GMC W5000 SERIES

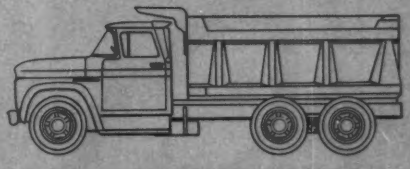
GVW	35,000—37,000 lbs.*
GCW	50,000 lbs.
AXLES—FRONT	7,000—9,000 lbs.*
REAR	28,000 lbs.
BRAKES—HYDRAULIC	953 sq. in.
FULL AIR	943 sq. in.*
ENGINE—V-6 GAS	351 cu. in. 180 hp.
	401 cu. in. 210 hp.*
TRANSMISSION	5-speed direct
	3-speed aux.*

*Optional

This Cab is Built to Outlast All Others with 2-layer roof and back panel construction, strongly reinforced sills and supports, stress and strain absorbing 3-point mountings. You also get all the cab comfort, convenience and safety you could ask for.



Here are just two of the many construction uses of these GMC W5000 Six-Wheelers



PULL

GMC

GENERAL MOTORS CORPORATION

TRUCKS

FROM ½ TO 60 TONS

YOU GET BUILT-IN BONUSES IN EVERY GMC TRUCK

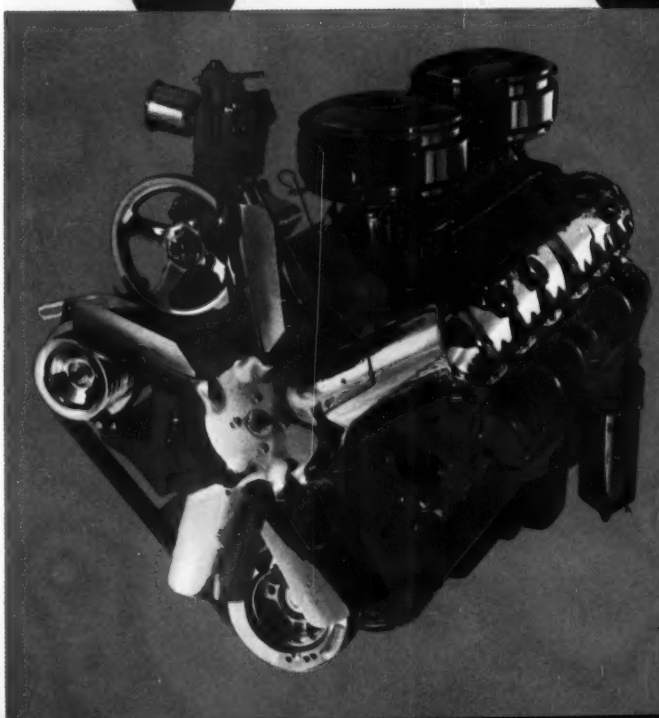
Exclusive V-6 Power at All Four Wheels! Only from GMC can you get the clawing, V-6 pulling power in 4-wheel-drive models. This exclusive engine is standard in 34 pickup models . . . one for any and every construction job.

Easy to Drive, Service and Own—GMC L4000 Tilt-Cabs. Turning is short with setback, wide tread front axle. Mechanics praise the easy-to-reach engine. Buying price is way down, including the standard, exclusive V-6 engine . . . lowest of all GMC tilt-cabs.

GMC Truck & Coach • A General Motors Division
Pontiac, Michigan

M

BW7000 SERIES



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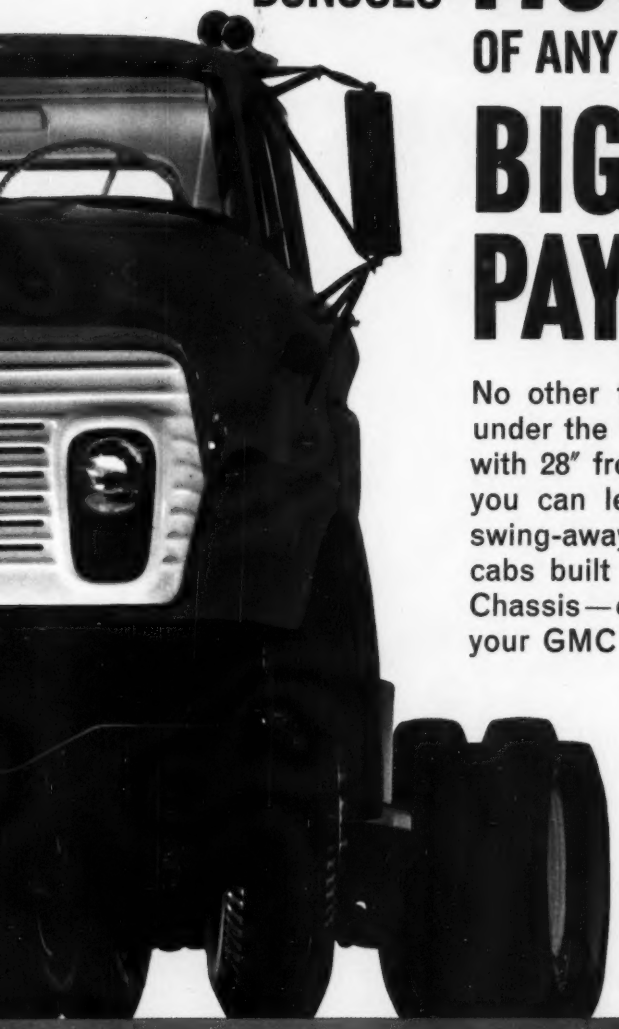
FOR A

MORE GMC BUILT-IN BONUSES

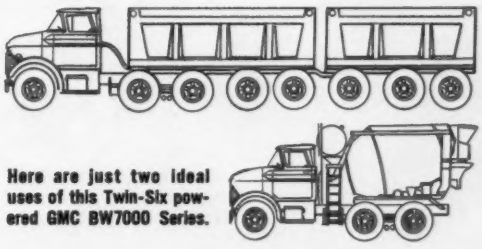
MOST POWER

OF ANY 90" GAS-POWERED TRUCKS

BIGGEST PAYLOADS OF ALL GMCs



No other trucks offer you all this—most "go" under the hood, the exclusive Twin-Six; 90" BBC with 28" front axle for all the weight and volume you can legally haul, up to 120,000 lbs. GCW; swing-away grille to cut service time and expense; cabs built extra strong outside, extra big inside. Chassis—everything you want and need. Just ask your GMC Truck Dealer, he'll prove it all to you.



Here are just two ideal uses of this Twin-Six powered GMC BW7000 Series.

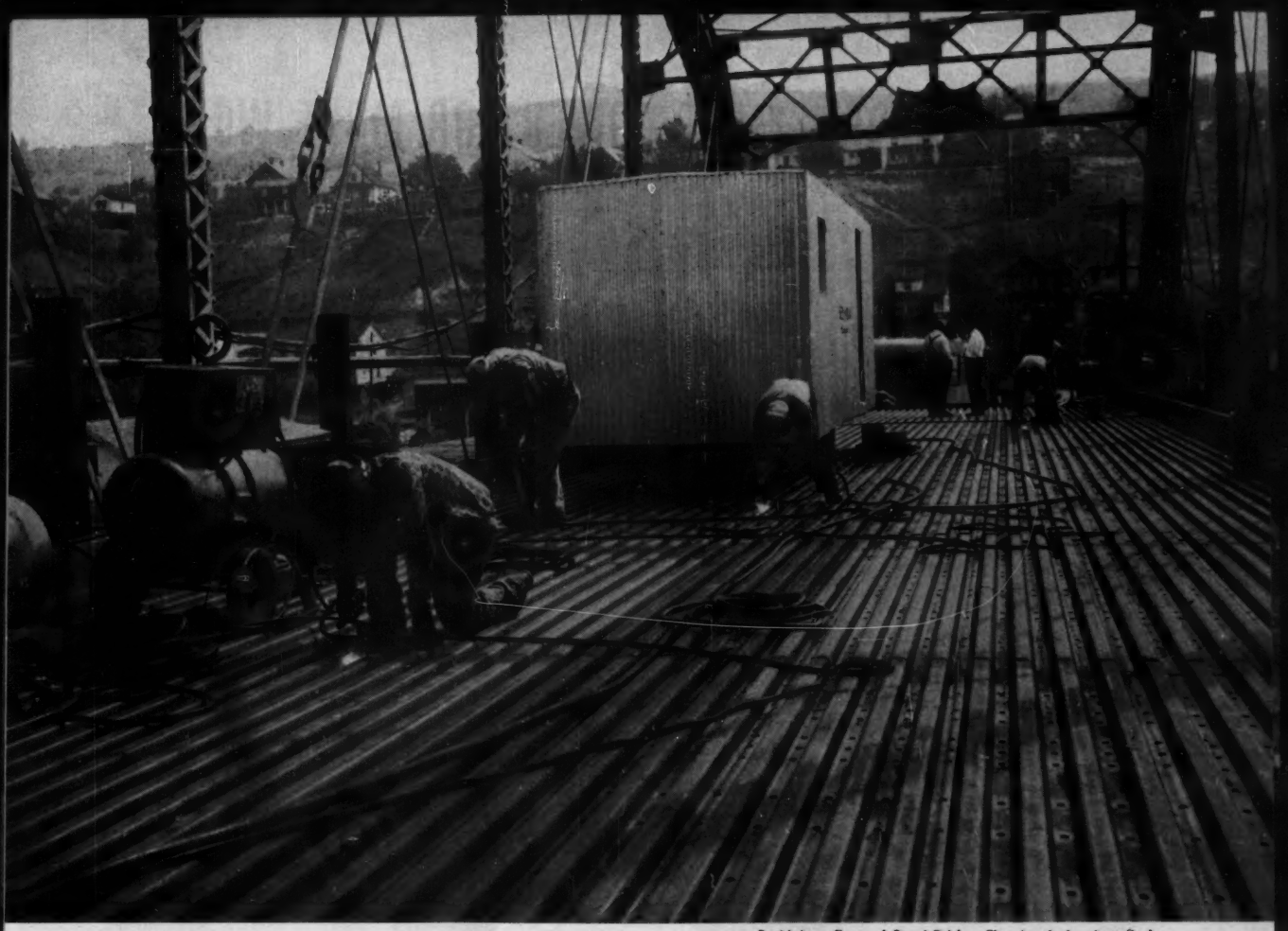
GMC TWIN-SIX
HIGHEST PERFORMANCE OF ANY STANDARD GAS ENGINE!

This GMC Twin-Six outpowers all others, every way. Look at the long span of the biggest load pulling power, torque . . . and the low engine speeds. This means you get your loads moving easier, faster and keep them moving on the tightest time schedules. Engine wear is less. Fuel mileage the best. Gear shifting is reduced up to 60%. And of prime importance, you get unsurpassed engine life.

SEE FOR YOURSELF

Engine	Max. Torque (lbs.-ft.)	Max. Horsepower
GMC	625-630 @ 14-2100 rpm	275 @ 2400 rpm
W	481 @ 16-1800 rpm	266 @ 3200 rpm
X	505 @ 2000 rpm	256.8 @ 3400 rpm
Y	617 @ 1200 rpm	232 @ 2100 rpm
Z	440 @ 1200 rpm	215 @ 2800 rpm

FOR ALL THE TIME AND MONEY-SAVING FACTS, GET IN TOUCH WITH YOUR GMC TRUCK DEALER LISTED IN THE YELLOW PAGES



Bethlehem Formed Steel Bridge Flooring being installed on the Donora-Webster bridge over the Monongahela River. *Contractor:* Ferguson & Edmondson Co., Pittsburgh, Pa.

Husky steel bridge floor adds new life to old bridge

When the bridge connecting the towns of Donora and Webster in western Pennsylvania needed reconditioning, some 45,000 sq ft of Bethlehem Formed Steel Bridge Flooring was installed over the bridge's steel stringers. The strong, formed-steel plate was used in 2-ft widths. It went into place quickly, providing a long-lasting, economical, and maintenance-reducing floor. After installation, a bituminous concrete surfacing was applied.

Bethlehem Formed Steel Bridge Flooring can be used for new bridge floors, or for reconditioning existing bridges. It meets the standard strength specifications for highway bridges of the American Association of State Highway Officials. For complete information on Bethlehem Formed Steel Bridge Flooring, call the nearest Bethlehem sales office.

Steel

for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Circle 36 on Reader Service Card

HERE'S MORE POWER FOR MORE WORK

new SCHRAMM series 62 heavy *Pneumatractor* model 12F backhoe model 4M loader

Series 62 is a self-propelled compressor . . . a 42 HP tractor . . . a heavy-duty backhoe . . . a hard-working loader . . . *all in one package . . .* does all four jobs . . . *costs far less than separate units to do the same work.*

Check these new Series 62 features:

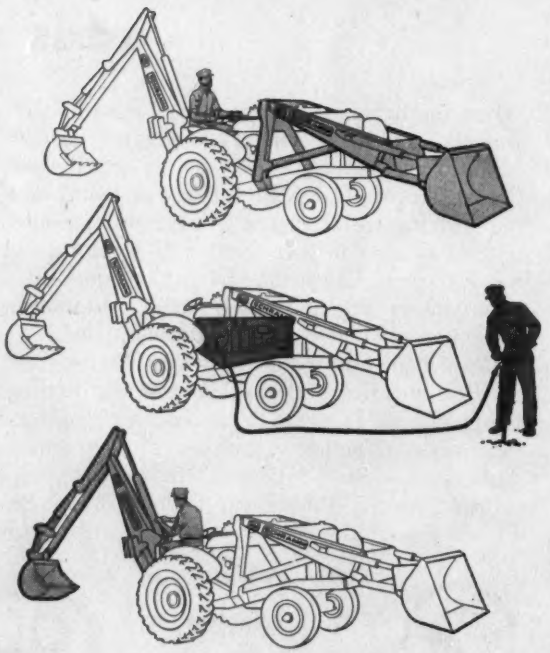
"Controlled Air Delivery" . . . now you can use your air power even while operating loader or backhoe.

New independently-mounted frame . . . relieves crankcase, clutch and transmission from operating strain.

Model 12F Backhoe . . . new heavy-duty construction . . . digs to 12'8".

Model 4M Loader . . . longer, higher reach . . . more load capacity . . . box steel construction.

These and many other new features make the Series 62 Heavy Pneumatractor the machine that costs you less . . . saves you more. For the full story write Schramm, Inc., 604 Garfield Ave., West Chester, Pa.



PART OF A
SCHRAMM
CO-ORDINATED AIR POWER
PACKAGE

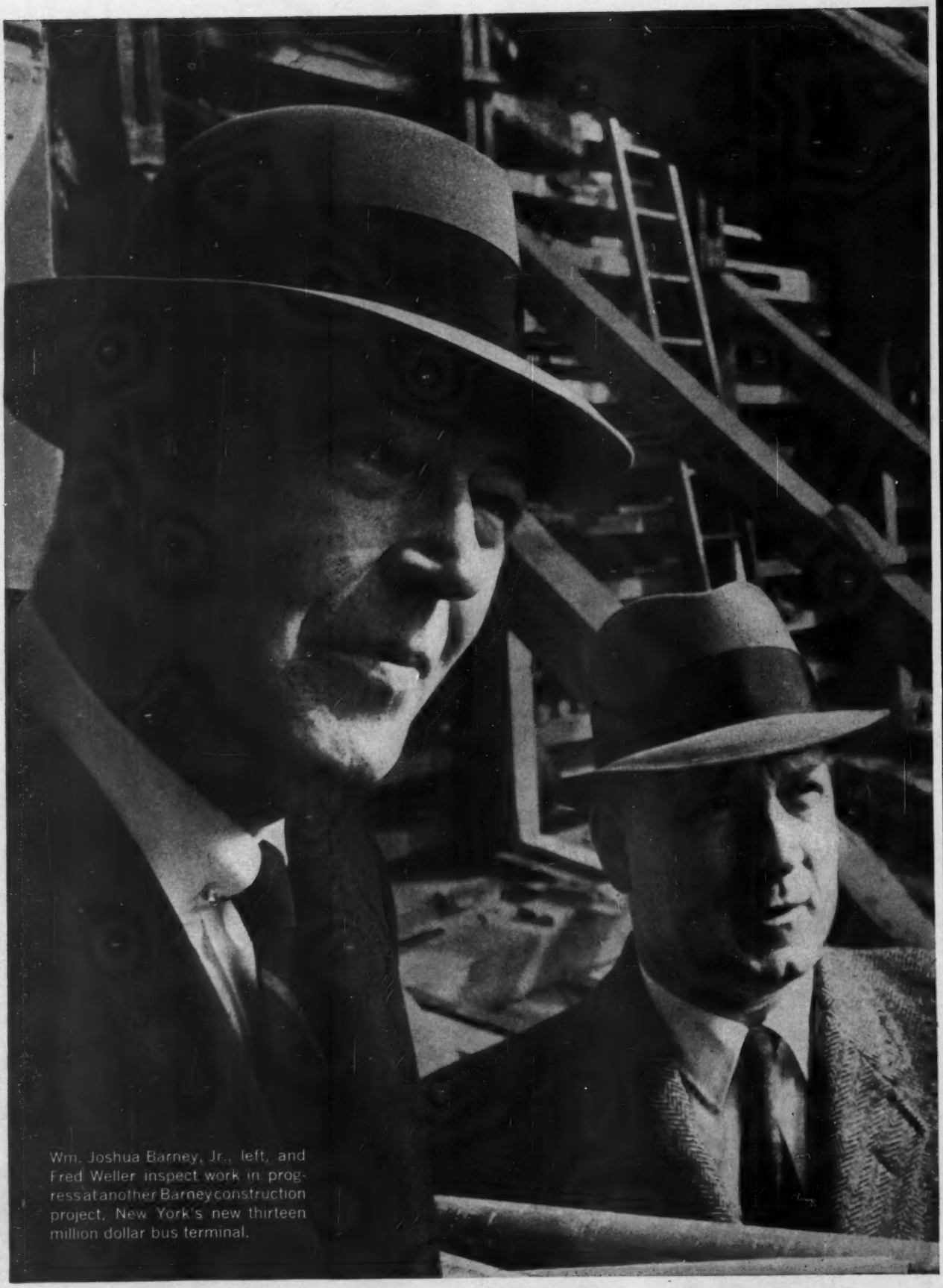
Circle 38 on Reader Service Card

CONSTRUCTION METHODS

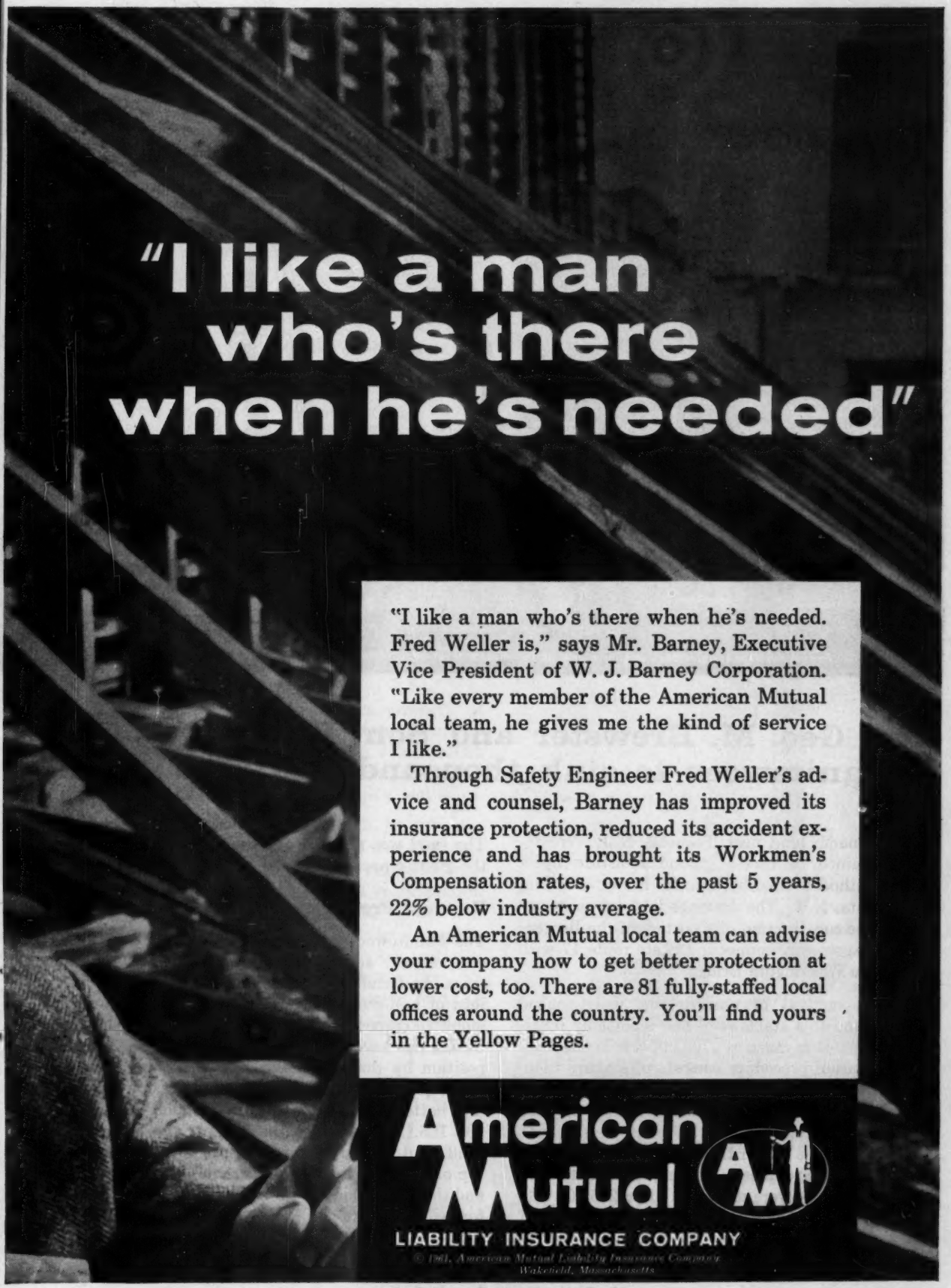
PICTURE OF THE MONTH

The Captain at the Helm

Well might the spreader operator consider this sea of concrete with awe. The three Koehring pavers in the photo at the right deposited the mix at the rate of 1 yd every 15 seconds on the day that these photos were taken. Production that day amounted to 6,009 ft of 24-ft-wide 9-in. slab during a 14-hr shift. Working on South Dakota's I-29, Western Construction Corp. paved 15.5 mi of twin 24-ft lanes in 76 working days. Production topped 1 mi a day five times. Western's spread was lead by Koehring Tribatch and Twinbatch pavers. Next came the Blaw-Knox spreader (above). With reinforcing in place, another paver brought the slab to grade. Then came Jaeger and Hetzel finishers.



Wm. Joshua Barney, Jr., left, and Fred Weller inspect work in progress at another Barney construction project, New York's new thirteen million dollar bus terminal.


"I like a man who's there when he's needed"
"I like a man who's there when he's needed. Fred Weller is," says Mr. Barney, Executive Vice President of W. J. Barney Corporation. "Like every member of the American Mutual local team, he gives me the kind of service I like."
Through Safety Engineer Fred Weller's advice and counsel, Barney has improved its insurance protection, reduced its accident experience and has brought its Workmen's Compensation rates, over the past 5 years, 22% below industry average.
An American Mutual local team can advise your company how to get better protection at lower cost, too. There are 81 fully-staffed local offices around the country. You'll find yours in the Yellow Pages.
American Mutual
AM
LIABILITY INSURANCE COMPANY
© 1961, American Mutual Liability Insurance Company
Wakefield, Massachusetts

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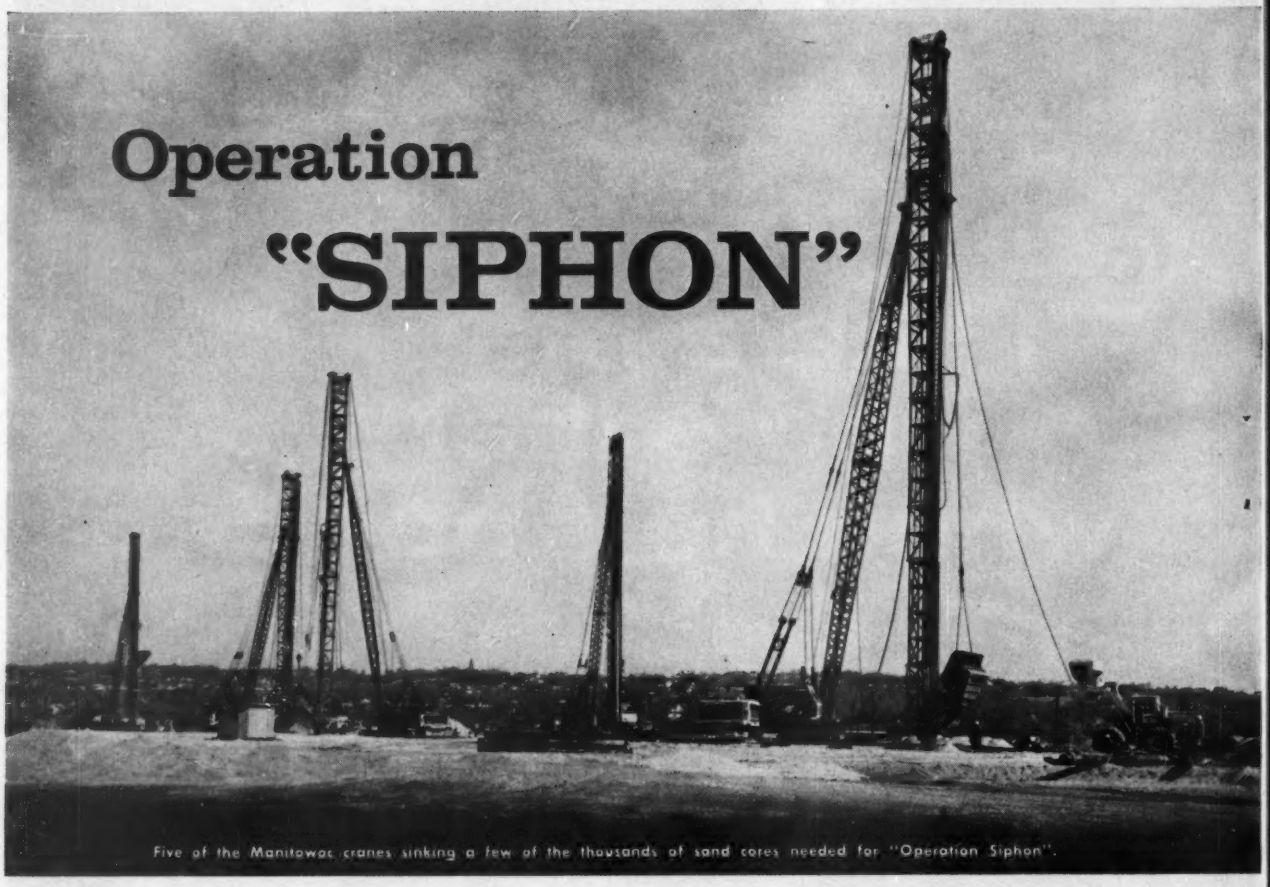


Five of the Manitowoc cranes sinking a few of the thousands of sand cores needed for "Operation Siphon".

How Geo. M. Brewster and Son, Inc. use 8 Manitowocs to sink thousands of sand cores

Acres of marsh land near Teaneck, N.J. were recently drained of excess ground moisture by a unique method devised by Geo. M. Brewster & Son, Inc., Bogota, N.J. The drainage job was necessary prior to the construction of a portion of the Bergen-Passaic Expressway connecting State route 17 with the George Washington Bridge.

Brewster's method of converting water-soaked meadow land to a stable road bed reportedly represents savings of as much as $700,000 a mile. Basically, the unusual procedure consists of sinking thousands of sand cores which tend to "siphon" ground water from the area. The present strata is composed of rootmat on top, followed by peat, organic silt, crusty clay, dense glacier till, and red shale bed rock. Eight Manitowoc cranes — ranging in capacity from 80 to 125 tons — were moved in after 205,000 yds. of mushy topping had been replaced with sand fill. The sand was needed to provide a firm footing for the giant cranes.

Unusual Procedure

The Manitowocs were equipped with air hammers, compressors, additional rigging, and special sand skips. In forming the sand cores, 20″ diameter casings of half-inch steel are driven by the hammer-mounted cranes to depths ranging from 60 to 135 ft. Casing tips have a hinged trap door, kept in a closed position by downward thrust, preventing clogging of the pipe as it is driven. When the casing reaches firm bottom, sand is forced into it under pressure of 100 P.S.I., compacting the column and forming a solid sand core. After air pressure is applied at the top of the pipe, the bottom trap door is forced open and the casing slowly withdrawn, leaving a perfectly-formed sand core.

Much in the manner of a wick, the core attracts ground water and "siphons" it to the surface. To aid this siphoning action, a second blanket of sand is laid over the entire area. Pressure, created by the weight of the sand blanket, forces below-level water to seek and follow the sand cores to the surface where runoff is carried by a network of drain pipes to the nearby meadows.

Manitowocs Fit Job Best

Mr. Ken M. Sterling, Superintendent in charge of the Brewster operation, said, "No other crane could do this type work as well and fast as Manitowoc." Because of the unstable ground condition found at the job-site, the outstanding stability of the Manitowoc cranes was an important factor. Every Manitowoc has an extremely low center of gravity with the counterweight placed low and far back. Huge, heavy, single-weldment carbodies also contribute to overall stability — are mounted directly on the crawler frames for rigid, unitized construction.

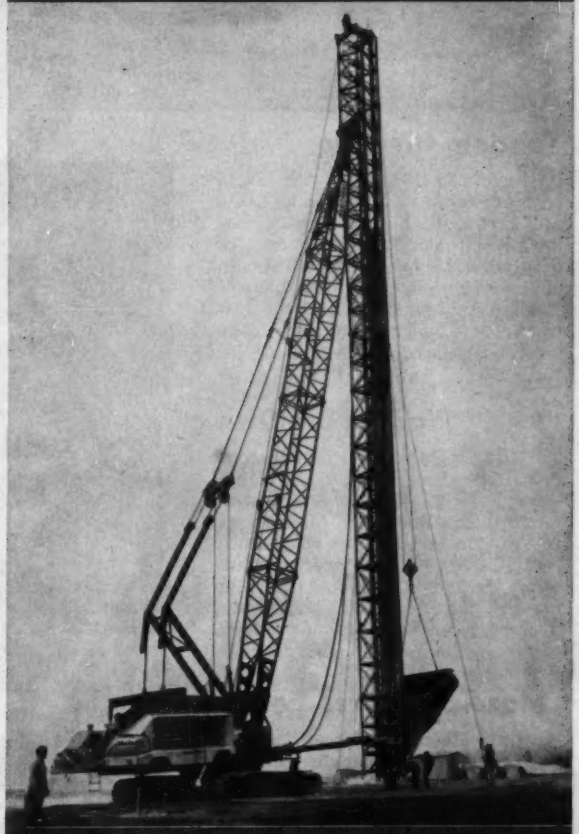
Unusually low ground bearing pressures, resulting from long, widespread crawlers, were important when traveling over the marshy ground. Without the "flotation" provided, the large cranes would have dug themselves in and mired down in the soft bed beneath their treads.

Manitowoc's clean design and extra strength of major components enabled the Brewster company to mount many heavy, bulky special attachments. The cranes carried 11 to 14 tons of compressors, in addition to sand skips and extra rigging and leads.

When leading contractors such as Geo. M. Brewster & Son, Inc. tackle a demanding job like this one, they rely on Manitowoc shovels and cranes to do a better job, with less downtime and maintenance. The same advantages that make Manitowocs first choice for the specialized jobs, can help *you* make more profit on conventional jobs, too. Ask your distributor for literature on the Manitowoc that fits your work schedule best. There's a wide range — from 1¼ yd. to 7 yds., and 25 tons to 125 tons.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

Brewster-designed sand skips ranging in size from 5 to 12 yards are filled with select sand shipped in by barge and rail to the New Jersey job site.



Loaded sand skips are hoisted up special leads — towering 118 to 174 ft. high — then automatically dump the load into the mouth of the casing where the sand is compacted under 100 P.S.I. pressure.

Manitowoc

The most *USEFUL* line of
Standard and Custom-designed machines

CRANES	TRUCK CRANES	SHOVELS	DRAGLINES	TRENCH HOES
25-125 TONS	45 and 60 TONS	1¼-6 YDS.	1¼-7 YDS.	1½-3 YDS.

Circle 43 on Reader Service Card

Construction News in Pictures . . .

Tandem for Two

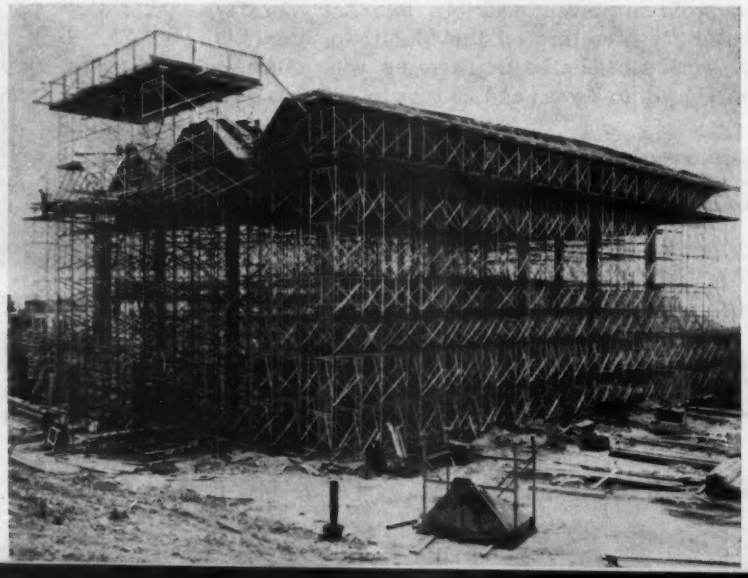
A single Cat D8 pushes two DW15 scrapers in an unusual tandem set-up, as the Richmond Fredericksburg & Potomac Railroad excavates a 50-acre site for new facilities. In light easily loaded soil with good traction, two pans are lined up less than 1 ft apart. The D8's blade spans both the scrapers' push blocks.

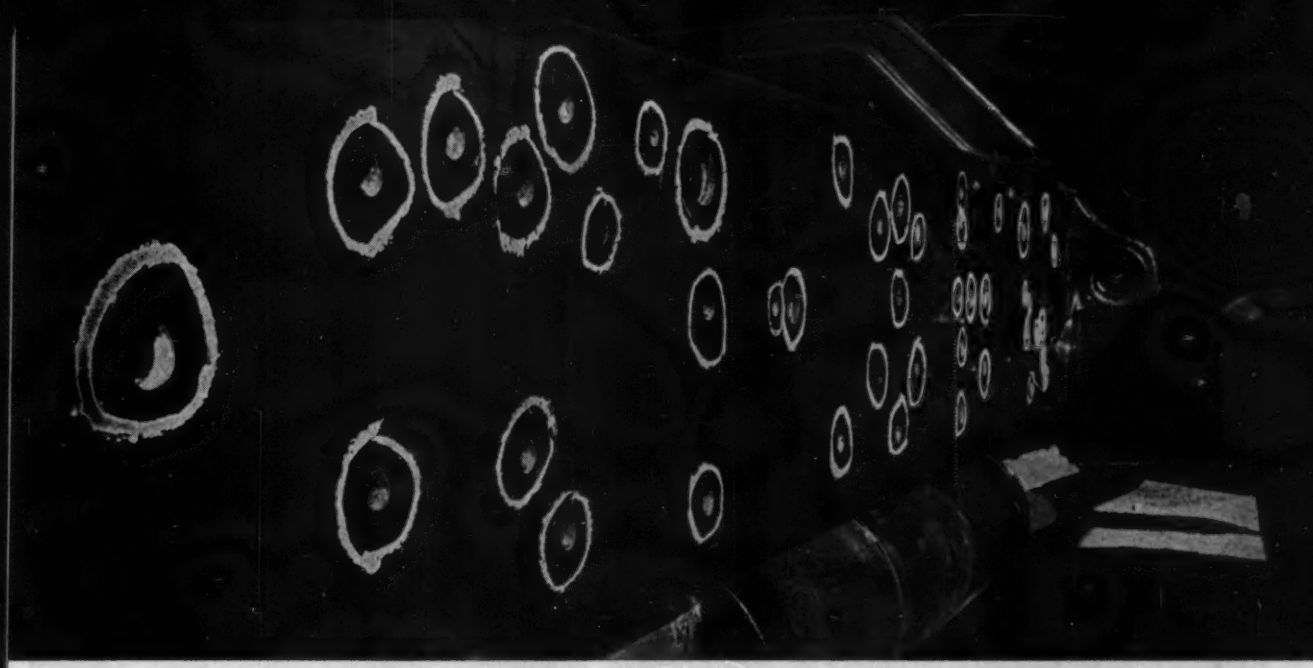
Placing Big Dish

To raise a 70-ton radio telescope dish from the ground to its mount near Palo Alto, Calif., Dearborn Moving Co., Dearborn, Mich., used two 90-ton P&H cranes with 110-ft booms. Crews had to erect the antenna, which will probe the solar system for Stanford University, in 7 hr to avoid afternoon winds.

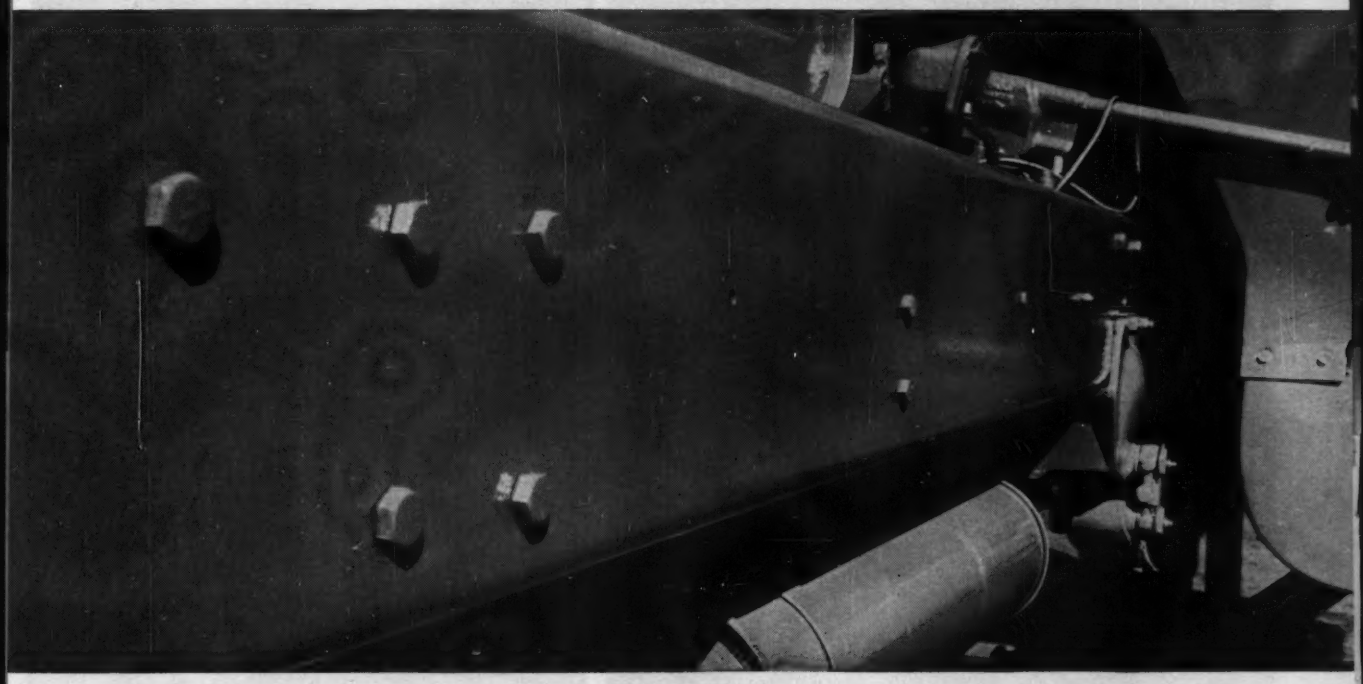
Maze Supports Forms

An intricate maze of scaffolding is used to support formwork for the roof of a physical education building at the University of Pittsburgh. Shoring supplied by the Patent Scaffolding Co., Inc., is used by joint contractors Samuel N. Zarpas, Inc. and Fullerton Construction Co. to construct 25-ft-wide folded plate roof sections for the gymnasium.





Chalk marks circle surplus holes in frame of mass-produced truck



White truck frame

We don't make White Trucks out of Swiss Cheese

Makers of mass-produced, assembly-line trucks punch their frames with every possible combination of holes to accommodate dozens of variations in components. Some of their frames have so many extra holes they look like Swiss cheese.

WHITE heat-treated, high-alloy steel frames are custom-drilled with the exact number of holes needed for *your* set of components. No more.

And for even greater total chassis strength, WHITE attaches all components with nuts and bolts, rather than rivets.

It's this kind of quality that makes the difference between a mass-produced, assembly-line truck and a truck from WHITE—*the company that stays close to its customers—and listens when they speak.*

THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO

Branches, distributors, dealers in all principal cities

WORLD LEADER IN HEAVY DUTY TRUCKS

WHITE TRUCKS

Circle 45 on Reader Service Card

ROCK AND RUBBLE is never a problem for a G-900. Two sets of grouped controls . . . one at turret, one at boom end . . . save driller time and steps . . . keep him banging down blast holes right on schedule.

MUD, MUCK OR MIRE...the new G-900 takes bad going right in stride. You can always tram into position no matter how tough the going . . . stay put when set.

any ground is right for a Tracdril!

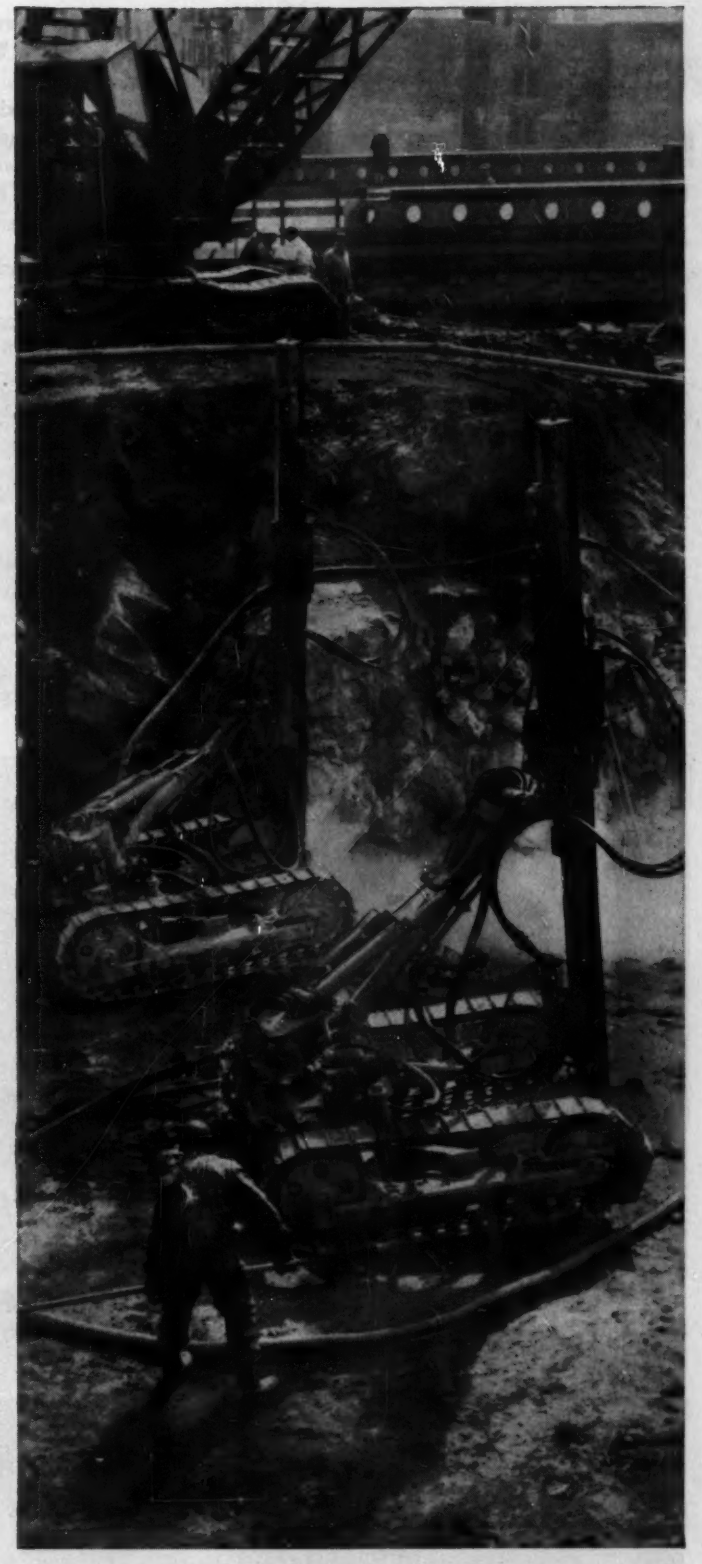
Hard-slugging, easily controlled G-900's can lick your toughest drilling problems . . . keep coming back for more

Tough terrain and a tight schedule often go together. Put sure-footed, hard-hitting G-900 Tracdrils on the job and the blast holes go down fast. "Boarding House Reach" (180° boom swing) pays off . . . you can drill more holes from every set-up. Shifts quickly from verticals to high horizontals . . . 11 feet at the face, or snake holes at ground level. Bad footing can't stop a Tracdril! And in spite of grades, mud and boulders, the heavy-duty brakes hold 'em where you put 'em. Brakes lock automatically the instant the tramming throttle is released.

Get complete specs on the NEW G-900! Write for SP-3267 to: **Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.**

Chicago Pneumatic

PORTABLE AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS
REICHdrills • THREE-CONE AIR-BLAST BITS • ROCK DRILLS



MANHATTAN SCHIST AND GRANITE demand constant, hard-slugging action. And deep cuts demand the stamina that only a G-900 can deliver on a full shift basis day after day.

Circle 47 on Reader Service Card

"...nothing like a UNIT for low upkeep"

—H&W CONSTRUCTION CO.
MORTON, WASHINGTON

Specializing in road building, the H&W Construction Co. uses a 5/8-yd. Model 617 shovel to load all its road surfacing material. The UNIT feeds the company's crusher, handling approximately 450 yards of material per day, and, in addition, loads out all trucks. The owners have this to say: "There's nothing like a UNIT for LOW UPKEEP. We've run ours four years with less than $100 repairs expense, and have run it steady, too."

Low upkeep naturally results from UNIT advanced design. For one thing, UNIT gives you the industry's *only* one-piece main machinery gear case. All gears, shafts, and bearings are completely enclosed in a constant oil bath. Flawlessly sealed at every point, this case keeps lubricants in — dirt and abrasives out!

Advanced design carries over to component parts, too. *All* spur and bevel gears, worm drives, and rollers are forged for uniform toughness. Shafts are involute splined for greatest strength. Gears, shafts, and many other essential working parts are scientifically heat-treated; wear surfaces are flame-hardened for longer life.

Why not take time out to talk to the owner and operator of a UNIT in your area. See how often LOW UPKEEP and HIGH PRODUCTION pop up during the course of your conversation. Then, get in touch with your local UNIT distributor ... let him give you all the facts!

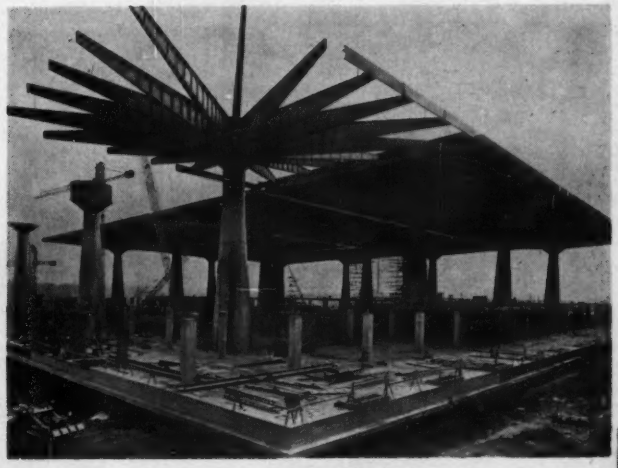
UNIT

UNIT CRANE & SHOVEL CORP.
6305 W. Burnham Street
Milwaukee 19, Wisconsin

SHOVELS: ½ Yd. to 1 Yd. • CRANES: 5½ Ton to 21 Ton • DRAGLINES ½ Yd. to 1 Yd. • TRENCHOES: ½ Yd. to 1 Yd. • TRUCK CRANES: 10 Ton to 40 Ton

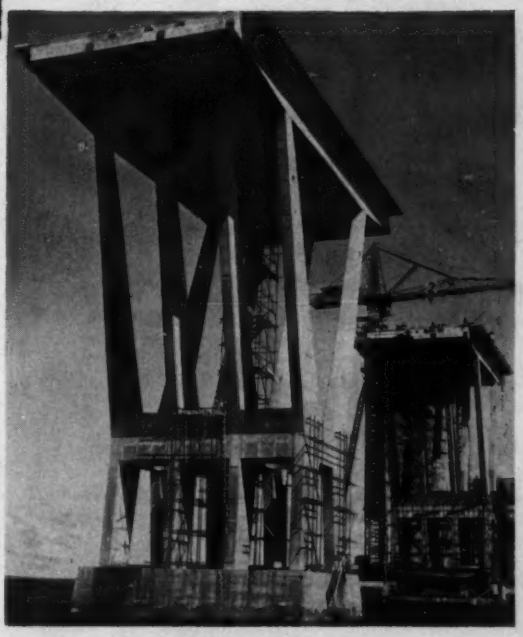
Circle 48 on Reader Service Card

Construction 'Round the World . . .



In Italy

Sixteen umbrellas, each a reinforced concrete column 66 ft high topped with 20 steel girders, support roof sections of the Labor Palace at Turin. As each 125-ft-sq roof section is completed the inside finishing work is started. Six sections of bolted steel forms were used to concrete each column by designer-builder Pier Luigi Nervi.

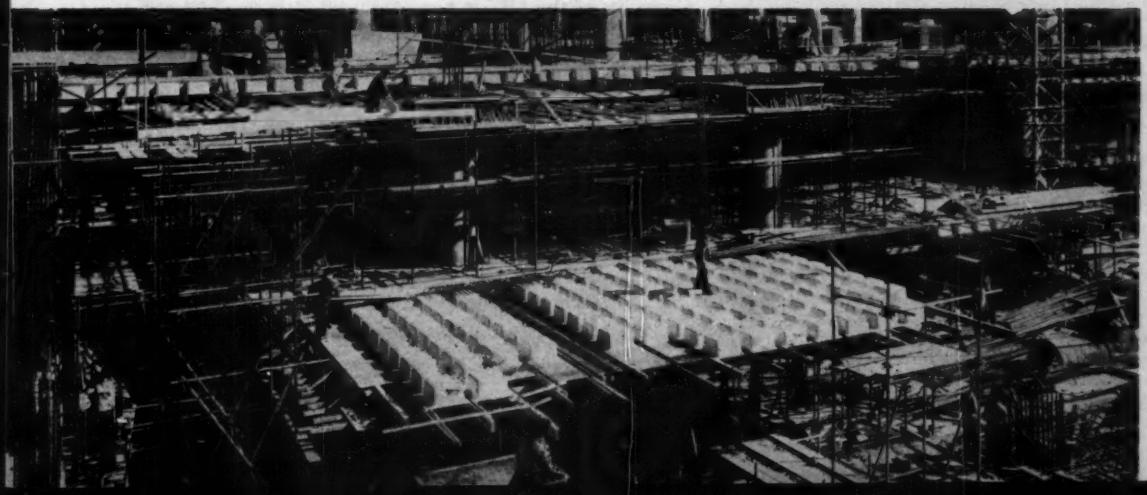


In Venezuela

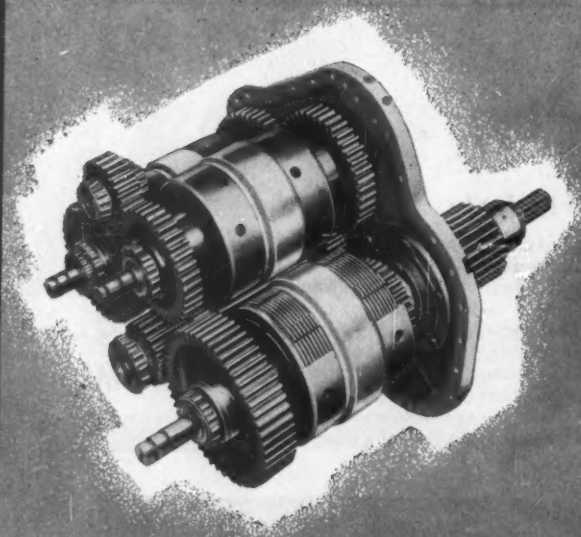
Decks for the 5½-mi long bridge spanning the outlet end of Lake Maracaibo are cast in place on top of trestles made up of four X frames. The platforms consist of two 128-ft-long box girders, each 28½ ft wide at the top flange and 9 ft deep. Cantilevered ends of the platforms support 143-ft prestressed girders. About 450 prestressed girders will be used by the German contractors. To cast each deck in place, the contractor prefabricates two identical wooden forms that are supported by steel trusses. A crane places each assembly on the trestle.

In England

Hollow mold construction with fiberglass pans is speeding construction of continuous floor slabs for London's $9 million air terminal building at Kensington. Supports and timber runners are fixed so that the pans can be stripped the day after the floor slab is poured. Slabs are supported by caps at top of 4-ft-dia concrete columns.



this new power-shift transmission



NOW YOU CAN CHOOSE your LeTourneau-Westinghouse B Tournapull® with either Fuller step-gear transmission (with LW High and Low Range) . . . or all-new *LW-designed-and-built* POWERFLOW 700 transmission. It's a constant-mesh, countershaft-type unit with full power-shift and torque converter . . . extremely simple, reliable, proven in over two years of testing.

No "shift-shock"

Because double-acting clutches in the "700" *cannot* engage simultaneously, you'll never have gear "overlap" or "underlap", therefore never be troubled with "shift-shock". Wet-disc range clutches engage hydraulically by means of manually-operated rotary valves.

Cooler running

Pressurized "mist"-type lubrication reduces amount of oil within the case, therefore minimizes heat-load common to splash or cover lubrication. All transmission oil is filtered and cooled, with throw-away filters.

8:1 ratio and QUIET

The 8:1 ratio spread of the "700" is the widest in the industry. You will find it exceptionally *quiet*, too, because ground spur gears, mounted next to bearings on large-diameter shafts, are used throughout.

Rear-mounted for accessibility

You won't often have to work on *this* transmission, but when you do, you will find it easy. It's rear-mounted, for fast, "walk-up" accessibility and removal.

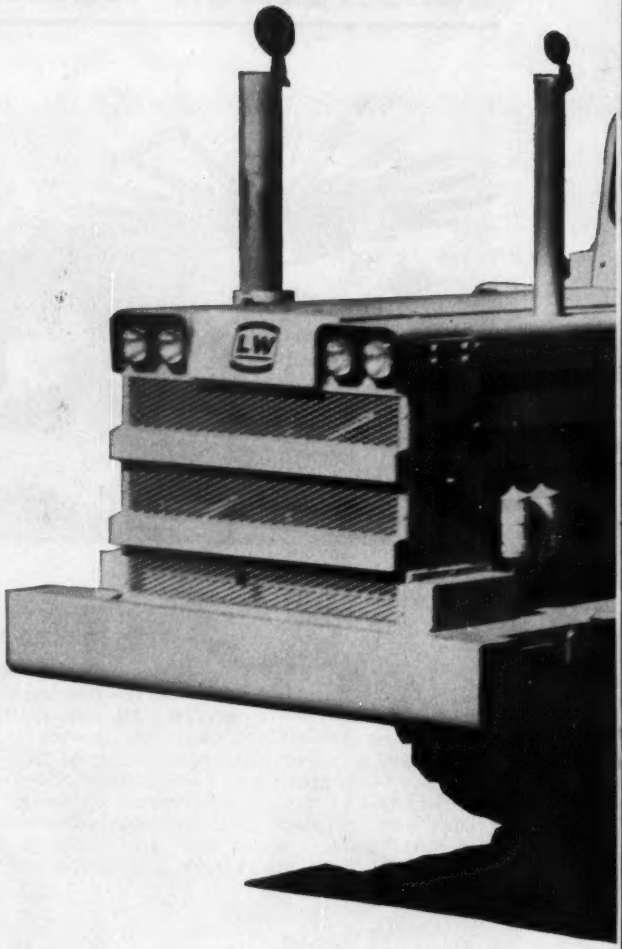
Automatic lock-up

For dollar-saving "straight-drive" operation at higher speeds, the "700" features automatic lock-up. An extra: the lock-up clutch also engages automatically when hydraulic brake is applied, so that *engine* braking power is added to that of the hydraulic brake.

Gear-coupled torque converter

For easy installation and removal, the "B's" torque converter is gear-coupled. It offers integral sump design, plus Full-Flow filtration of all converter fluid. It has a stationary stator, to eliminate "over-riding clutch".

NOW OFFERED



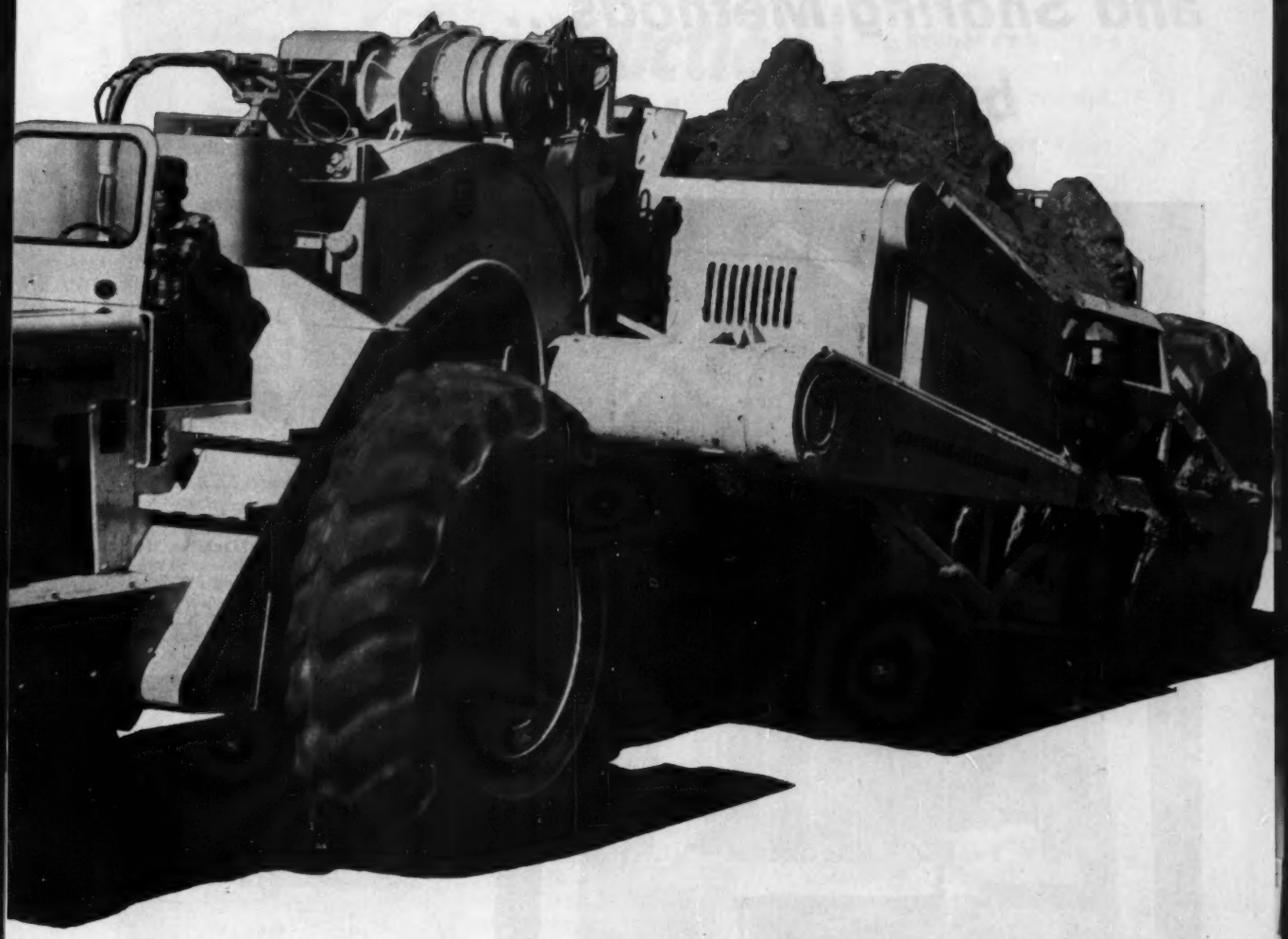
...plus these other

6,000 lbs more payload capacity;
5,000 lbs less "deadweight"

Capacity of the "B" is now 25 cu yd struck, 32 cu yds heaped, and 37 tons. That's 3 tons more than previous models. Yet, because the yoke, apron, and structural members of the Fullpak® scraper are now made of lightweight high-tensile-strength steel, the "B" weighs almost 5,000 lbs less than before! With its GM 12V-71 diesel producing 430 hp at 2100 rpm, you enjoy the snap and power of the *best* power/weight ratio of any scraper of this type and size.

Your LW Distributor has the complete story of these B 'Pull improvements. He can show you how they can work for you . . . for lowest-net-cost-per-yard. See him now.

IN TODAY'S BIG YARDAGE B 'PULL*



new production-boosters:

Dry type air cleaners

Most effective air induction system available! Two-stage filtration provides long element life, and first-stage element *cleans itself.*

Single-motor control of apron, bowl-hoist

One motor and a new cable-control unit now operate both your apron and bowl-hoist. This reduces generator loads, reduces service and parts requirements.

Feather-touch lever controls

Your operator now controls scraper work-motions with three "fast-grasp" knobbed levers that move forward and back swiftly, with "feather touch" instant "feel-of-load" response.

You will find many *more* improvements in the B Tournapull. A new tailgate design that speeds loading. New "straight-up" scraper side-sheets that make it impossible for rocks to lodge between sides and scraper arms. New safety latches with automatic "cut out". More than a dozen "maintenance speeders".

*Trademark BP-2486-DC-2

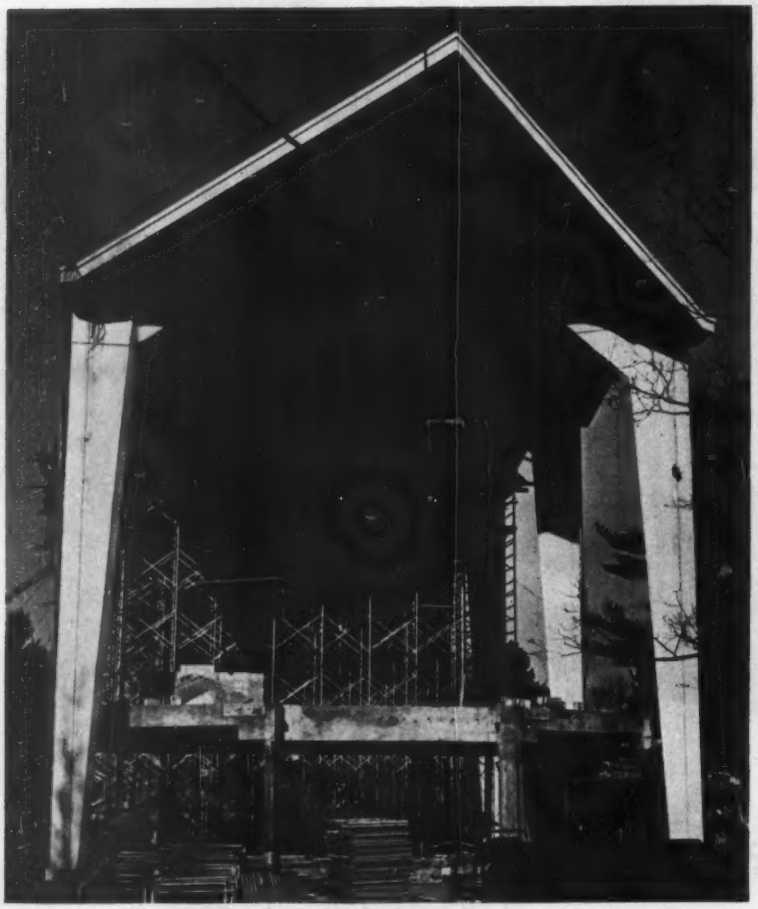
LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILL.
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Circle 51 on Reader Service Card

Scaffolding and Shoring Methods... by PSC

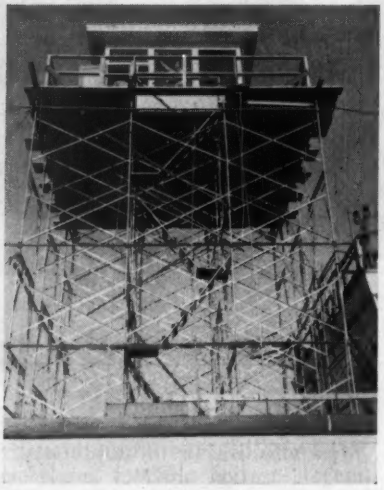


Safe, sure support for complicated roof . . .

20K frames (each capable of carrying 10,000 lbs. per leg) of "Trouble Saver"® Sectional Steel Shoring are used here to support this complicated 1′-to 5′-thick concrete roof system of sloping planes and hyperbolic paraboloids. Shoring is quickly erected in free standing, safe towers to meet varying heights. 5-bay, 52′ x 167′. St. Mark's Episcopal Church, New Caanan, Conn., is being constructed by Frank Mercedes & Son, general contractor.

Double decker . . .

Upper level is standard 5′-wide "Gold Medal"® Safety Scaffold Machines used for installing face brick. Lower level is special 5′-wide platform hung 6′6" below by steel cable from upper scaffold, used for installing shadow wall. Y.M.C.A. building, New Orleans, Gervais F. Favrot, contractor.



Temporary tower . . .

26′-high "Trouble Saver" Scaffolding tower with interior steel stairways is erected atop the 126′-high Terminal Building, Logan Airport, Boston, for use by Federal Aviation Agency. 6′6" end frames are tied together with standard diagonal braces and extra "TubeLox"® tubular members. Entire unit is guyed to inserts welded in steel. Note interior "Trouble Saver" Scaffolding stairways for access.

THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street, Long Island City 1, N. Y. • 1550 Dayton Street, Chicago 22 • 6931 Stanford Avenue, Los Angeles 1
® Branches in All Principal Cities • IN CANADA: Canadian Patent Scaffolding Co., 329 Dufferin Street, Toronto

Circle 52 on Reader Service Card

Construction Methods AND EQUIPMENT

DECEMBER, 1961

VOLUME 43 • NUMBER 12

HENRY T. PEREZ, Editor

And Still They Fail

CONTRACTORS ARE GOING BROKE at a record rate. Failures in the first 9 months topped 1,100, according to Dun & Bradstreet. That's an 11% jump over 1960 and the highest since the depression of the '30's.

The bankrupts' liabilities rose too. They totaled $143,000,000, which is only a 3% increase over the comparable figure for 1960. But that is for the group as a whole. Liabilities of defaulting other-than-building contractors soared to 95% above last year.

Roadbuilders are included in this last group. And if today's ruinous competition and unrealistic bidding continue, more of them will move into the unhappy status of bankruptcy.

Many roadbuilding contractors blame the states for a lot of their difficulties. Indeed, the Highway Division of the Associated General Contractors recently condemned *"drastic change in engineering practices and procedures in a great many state highway departments . . . [that] are definitely reducing the contractor's ability to maintain high production and are therefore increasing his costs."*

The group passed a resolution that calls on state highway engineers to *"take aggressive action to:*

1) *Provide workable specifications which can be followed.*
2) *Give the resident engineer the authority he needs to properly inspect the work and make the necessary field changes without impeding progress and production.*
3) *Provide better testing procedures and methods which will prove the quality of the work as it is accomplished, without limiting in any way the contractor's ability to maintain high production with good modern equipment and methods."*

Obviously the state highway departments are not the only parties at fault. And in most cases, the contractor in trouble probably has only himself to blame for his plight.

Be that as it may, here is a good set of ground rules that Gen. Louis W. Prentiss, executive vice president of the American Road Builders Assn., believes will make the competitive-bid, contract method of construction work well:

1) The contracting agency must know what it wants, where it wants it, and when it wants it.
2) Specifications must be specific and clearly understandable.
3) The contracting agency must mean what it says in the specifications, and expect to enforce them.
4) Contractors must understand the specifications and expect to conform to their provisions.
5) There must be adequate information available concerning foundation conditions, climatic conditions, labor and materials.
6) Contractors must know the production capability of their organizations, both as to equipment and as to labor.
7) Contractors must know their unit costs and overhead costs, including the cost of financing, and must make adequate provision therefore in computing bids.
8) Contractors must provide for a reasonable profit in bids.

If both contractors and awarding bodies follow these rules, the outlook for better work—and profits—will brighten.

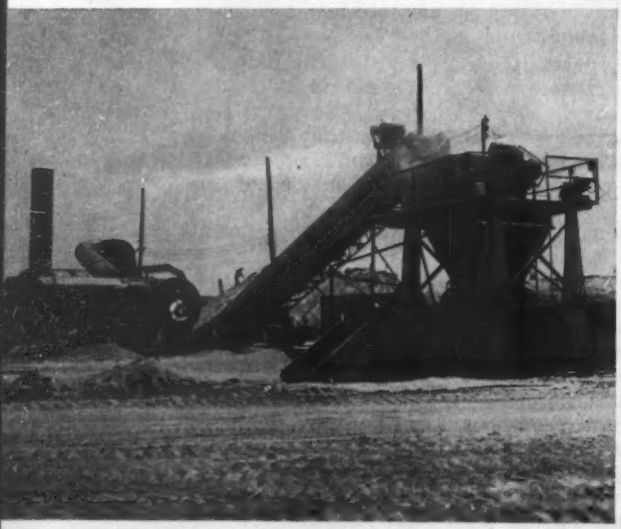
Two Mixing Methods on Job

FAIR WEATHER METHOD–ROAD MIXING

DRYING—Caterpillar No. 12 motor graders work aggregate windrow to dry the material before it is treated with asphalt. The moisture content in the aggregates must be reduced to 4% to meet the effective fines requirement for adding asphalt.

MIXING—The road mix spread consists of a Cat D8 that pulls a Wood road mixer and an asphalt tank truck. The mixer also pulls a wheel-mounted tank that holds 1,000 gal of asphalt. This eliminates stopping and starting to change tank trucks.

ALL WEATHER METHOD–CENTRAL MIXING

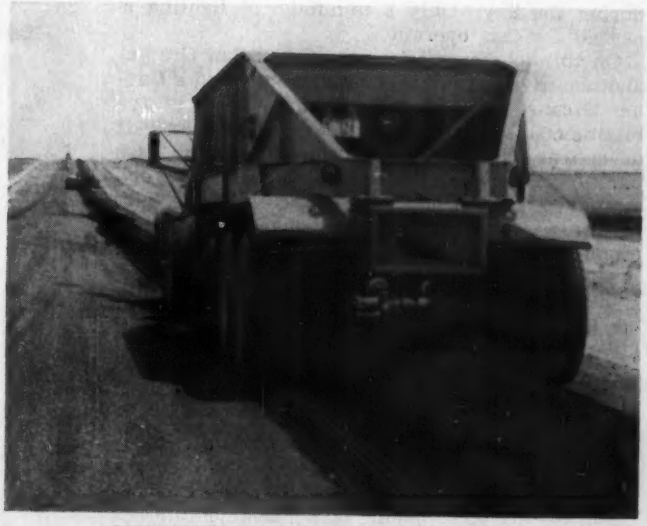


DRYING AND MIXING—Barber-Greene dryer with dust collector, at left, reduces aggregate moisture content to less than 0.5%, and a double-screw Eagle pugmill mixer adds asphalt, mixes it with sand, and loads it into bottom-dump wagons.

Speed Paving

By switching from road mixing to central mixing of bituminous base materials, a Kansas paving contractor was able to reduce the size of the equipment spread needed to place the base course and maintain high production through a rainy construction season.

BLACK BASE—The mixing spread leaves behind it a windrow of bituminous base material for a 3-in.-thick base course to cover one 24-ft-wide roadway. Following the mixing spread, graders aerate the material to evaporate 30% of the volatiles.



SPREADING—Bottom-dump wagon deposits windrow of bituminous base material on the roadway. The plant mixed material still must be aerated to reduce the percentage of volatiles before it can be spread. Motor graders handle the aeration.

By JOHN SILINSH, Associate Editor

EXPERIENCE GAINED last year while paving a stretch of Interstate 70 in western Kansas helped a contractor to increase production this year on a 21-mi section of the same highway.

This year's $3.8-million contract covered construction of a 16-in.-thick pavement consisting of 12 in. of bituminous base and 4 in. of hot mix asphaltic concrete. The bituminous base, placed on a compacted subgrade, contains sand and medium curing cutback asphalt (MC-4).

Last year, on an adjacent section of I-70, San Ore Construction Co. of McPherson, Kan., produced the sand-asphalt by mixing it on the road. Graded sand was placed in a windrow on the subgrade, and a traveling pugmill mixer picked up the windrow, added the MC-4, and deposited the mixed base in a windrow back on the subgrade. Then graders aerated and spread the mix.

This year, San Ore set up a stationary continuous mixing plant to produce the bituminous base material. The mix was placed in windrows on the subgrade, and graders aerated and spread it.

Which method is better? It depends primarily upon the weather. In a hot dry season, road mixing is slightly cheaper. In wet weather, plant mixing offers a definite cost advantage.

With central mixing, San Ore began placing and spreading the base material almost as soon as rain stopped. The mixing plant included a dryer that maintained uniform moisture and temperature in the aggregates, despite a wet stockpile.

With road mixing, a fleet of motor graders was needed to aerate the aggregate windrows until the moisture was reduced to within acceptable limits. Only then could the mixing operations begin.

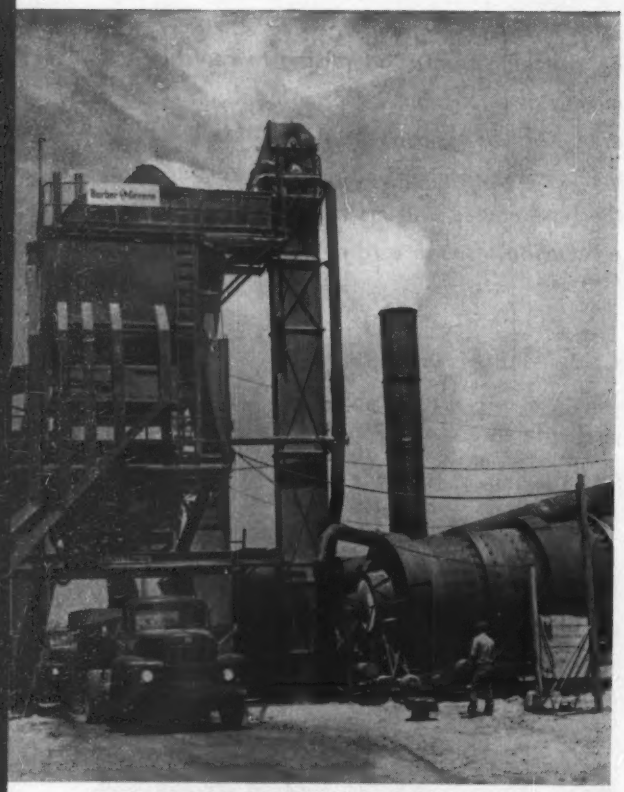
A typical San Ore equipment spread for road mixing consists of the following:

- 5 No. 12 Caterpillar motor graders (one with Preco leveling attachment)
- 2 Seaman Tillers
- 1 25-ton self-propelled pneumatic-tired roller
- 1 Pull-type pneumatic-tired roller
- 1 8-to-10-ton tandem roller
- 1 Windrow evener
- 1 Pettibone Wood road mixer

In good weather this spread handled an average of 400 tph. In wet weather, when re-drying was necessary, production was much lower.

This equipment spread may look a bit excessive, but requirements in the Kansas highway specifications make it difficult to meet the specs with smaller spreads.

The most difficult specification to meet is that 40% of the –200 material must be effective. This



BATCH PLANT PRODUCES BITUMINOUS BASE—Before this Barber-Green batch plant started producing asphaltic concrete for the surface courses, it's capacity was utilized to produce some bituminous base to speed work on base course laying.

TWO MIXING METHODS . . . *continued*

means that not less than 40% of the material that will wash through a 200-mesh sieve must pass that sieve when dry screened. Occasionally, San Ore had to use a pneumatic-tired roller to break up the balls of fines in the aggregates.

Another specification says that the mixed base material cannot be spread and compacted until at least 30% of the volatile matter contained in the bitumen has been dissipated through aeration. This specification and the effective fines requirement made it necessary for San Ore to add two graders, two tillers, and one roller to the spread.

The contractor is permitted to apply the MC-4 when the moisture content in the sand is 4% or less. But if the –200 material is plastic, the effective fines requirement cannot be met until the moisture content is reduced to 1%. In humid weather, considerable re-drying is necessary to meet this requirement.

Dissipating the volatile material in the mixed base is easier than reducing the moisture content of the aggregate. Because of this, weather has less effect on central mixing than on road mixing.

Because the weather in that part of Kansas has been anything but hot and dry during the past two construction seasons, road mixing suffered long delays throughout the summer. One of San Ore's paving superintendents says: *"We first put a sand windrow on the road on May 19, and did not apply the MC-4 until June 22."*

This means that central mixing was the only production method used during one month. And this is one of the advantages of the central-mix method. On the I-70 project, San Ore paved the middle third of the 21-mi stretch by the central-mix method, and the end thirds by conventional road mixing techniques.

The central-mix plant was assembled by San Ore. It incorporated a dryer, dust collector, pugmill mixer, and conveyors.

The dryer is a 7x30-ft Barber-Greene Model D60 that was coupled with a Barber-Greene 858 dust collector. The stabilization mixer is a 3x8½-ft Eagle double-screw unit fed by a 36-in.-wide belt conveyor from the dryer. The main conveyor that fed the dryer is 30 in. wide, and two side conveyors are 24 in. wide each. All conveyors were made in San Ore's shops.

This installation handled about 190 tph of dried aggregate, reduced the moisture content to less than 0.5%, and produced a total of 150,000 tons of material.

In addition to making the paving operation less dependent upon the weather, central mixing offers the contractor several other advantages.

The quality of the mix is easier to control in a plant because a steady moisture content and temperature can be maintained in the aggregates. Also, all of the aggregates passing through the pugmill are thoroughly mixed with asphalt; on the road, some material may not be picked up by the traveling mixer.

And there is no problem of untreated aggregates being spilled on the previous lift. This reduces the cleaning necessary between lifts. San Ore estimates that it takes twice as long to clean up before laying the mix than it does to prepare the sand for road mixing. A grader and a rotary broom handle the cleaning.

Night shifts can be utilized with a central-mix plant. At night, when temperatures are lower, road mixing is practically impossible because moisture evaporates very slowly. But with plant mixing, all that is necessary on the road is to place the material in windrows that are aerated and spread during the day. Only a minimum of lighting is needed for this operation.

On this job central mixing offered San Ore yet another advantage. The contractor utilized a Barber-Greene batch plant to produce some of the bituminous base. The 896 plant with a 9x20-ft dryer was set up to handle production of the asphaltic concrete for the surface courses. This operation could not begin until enough base was laid, and to speed this job the batch plant was used to produce 75,000 tons of bituminous mix.

This plant averaged 225 tph. It ran on a fully automatic 40-sec cycle and produced 6,000-lb batches. Five conveyors fed this plant, but only three of them were in use during the production of the black base.

A fleet of 24 bottom-dump wagons pulled by International Harvester truck tractors hauled and windrowed 15 to 20-ton loads of the bituminous base. Dump trucks supplied aggregates to the mixing plants.

San Ore set up screening plants in nine different pits after making several thousand test borings while prospecting for the materials. Pits near the center of the job supplied the central-mix plants and pits near the ends of the project produced

sand for the road mixing operations. Maximum haul distance for aggregates was 9 mi.

Road mix spreads worked at each end of the 21-mi stretch. Each averaged about 4,000 tons in a 10-hr day in good weather. This equals about 1 mi of 3-in.-thick lift on two 12-ft lanes. A total of 225,000 tons was placed by road mixing.

In each of the road mix spreads, a Caterpillar D8 pulled a Wood mixer, which in turn pulled an asphalt tank. The tank provided storage for 1,000 gal of asphalt and eliminated stopping and starting while tank trucks were changed. Graders followed to aerate the material to reduce the percentage of volatiles to 45-50%.

One grader aerated about 1 mi of a bituminous base windrow in two days. By comparison, one grader handled 1 mi in one day when the base was mixed in a central plant. This gain in production resulted primarily from the higher aggregate temperatures obtained by central mixing.

San Ore operated a total of 15 Caterpillar No. 12 motor graders for aggregate drying, mix aeration, and spreading. Two of the rigs, one in each road mix spread, were equipped with Preco automatic slope leveling attachments. These were used primarily for finish grading.

Compaction equipment consisted of a 10 to 12-ton Buffalo-Springfield tandem roller for initial knockdown, a 25-ton Ferguson pneumatic-tired roller, and a 12 to 15-ton Buffalo-Springfield three-wheel roller for finishing.

Following completion of the 12-in.-thick base San Ore placed the 4 in. of asphaltic concrete in two 2-in. lifts. Two Barber-Greene 879A finishers and a Cedarapids unit handled this operation. San Ore modified both of the B-G units by adding a level indicator that works in conjunction with a string line set on grade blocks, to show the slope.

The indicator consists of a cross bar that is supported on posts attached to the paver's screed arms. A pointer extending from one post to the other pivots about a pin in the center of the cross bar, and a pendulum attached to the pointer and damped in a tank of oil keeps the pointer from bouncing excessively as the machine moves along. Both ends of the pointer travel over scales graduated in inches on the vertical posts. The operator watches the pointer to adjust the cross slope.

Another modification on the Barber-Greene finishers was necessary for paving the inside shoulders along the roadways. The shoulders are only 3 ft wide, and the paver required the addition of a partition plate between the paver's augers and a cut-off plate under the screed.

Combining the continuous mixing plant, the batch plant working as a base mixing unit, and the two road mixing operations gave San Ore enough flexibility to maintain a high rate of production and to complete the work on schedule in spite of the wet season in western Kansas this year

In the future, San Ore expects to use continuous mixing of the black base on other jobs. Even though central mixing of the base can be handled easily by a batch-type plant, the lower cost of moving and erecting a continuous plant gives the edge to continuous mixing. Also, it is likely that future mixing plants of this type will have bigger dryer capacities for higher production.

San Ore's general superintendent, Everett Davidson, feels that the trial run of the continuous mixing operation on the Kansas project was a success. The state highway engineer, Walter Johnson, concurs in this opinion.

Other personnel on the job for San Ore were Herman Rau, superintendent at the batch plant; Jack Mauser, superintendent at the continuous mixing plant; and Claude Morrison, night foreman at the continuous plant. Lay down superintendent was Bill Nuttall, superintendent of the west section was Pete Johnson, and superintendent of the east section was Francis Ullery.

Resident engineer for Kansas Highway Dept. was Roscoe Wall; district engineer was T. W. Hicks; district construction engineer was Dave Mickey.

CONTRACTOR'S PIT SUPPLIES AGGREGATES—Portable Kolman loader fills dump truck with sand from one of nine aggregate pits on the job. San Ore made several thousand borings while prospecting to find materials to supply the job.

Big Scrapers

FAST BOOSTING—Pushed by tandem wheeled dozers, scraper leaves the cut at close to 15 mph. Pushers are fitted with cushion push blocks, and louvers to deflect engine heat. Later, twin-exhausts were modified to single muffled exhaust to cut noise.

NEAT COMPACTING—On the fill, material spread by scraper is smoothed by dozer blade for more effective compaction to 90% modified density by Southwest 75T roller. Four-wheel roller is towed by DW20 tractor, whose dozer was added by contractor.

OVERSIZE SCRAPERS, high-speed push tractors, and downhill loading—that recipe is netting a California grading contractor better than 5,000 bank yd per hr on a big housing project near his headquarters in South San Francisco.

The job, Westbourough Homes, is big; about 14,000,000 yd. So are the scrapers; up to 50 yd heaped. And the primary pushers are two 90,000-lb rubber-tired Michigan dozers in tandem.

Contractor Buzz Haskins likes big rigs. Of his eighteen scrapers on the project, four carry 50 yd heaped and six tote 45 yd, while the eight "babies" haul 38 yd each.

All the scrapers are Caterpillar units behind DW20 tractors. They are enlarged, or "giantized," by Peterson Tractor Co. of San Leandro by sideboarding and lengthening the bowl of regular Cat 482 and 456 pans. Originally, these rated, respectively, 35 and 27 yd heaped.

Dozers Modified for Tandem Pushing

The paired Michigan Model 380 dozers that Haskins uses as pushers ride on 33.5-33 wide-base tires and are powered by 430-hp 12V-71 GM diesels. And these rigs, too, were modified—by Buran Eqpt. Co., Santa Clara.

To reduce noise, the dozer's usual twin exhausts were manifolded to a single stack, and a Nelson muffler was added. To deflect engine radiator exhaust heat up and away from the following pusher operator, curved steel louvers were welded to the radiator grilles. And to reduce shock loads, a cushion push block was added to each dozer. The block is a two-piece affair, with a hinged plate separated from the rest of the unit by two 6x6x12-in. rubber cushions.

The soil Haskins is working in at Westbourough Homes is a compacted silty sand. To prepare it for scraper loading, pairs of Cat D9's rip it. And these double as pushers as needed.

The housing project site is hilly, and naturally Haskins takes advantage of this to load and haul downgrade where possible. He claims this lets his big scrapers reach speeds of 35 to 45 mph.

Get 50-Yd Load in 40 Seconds

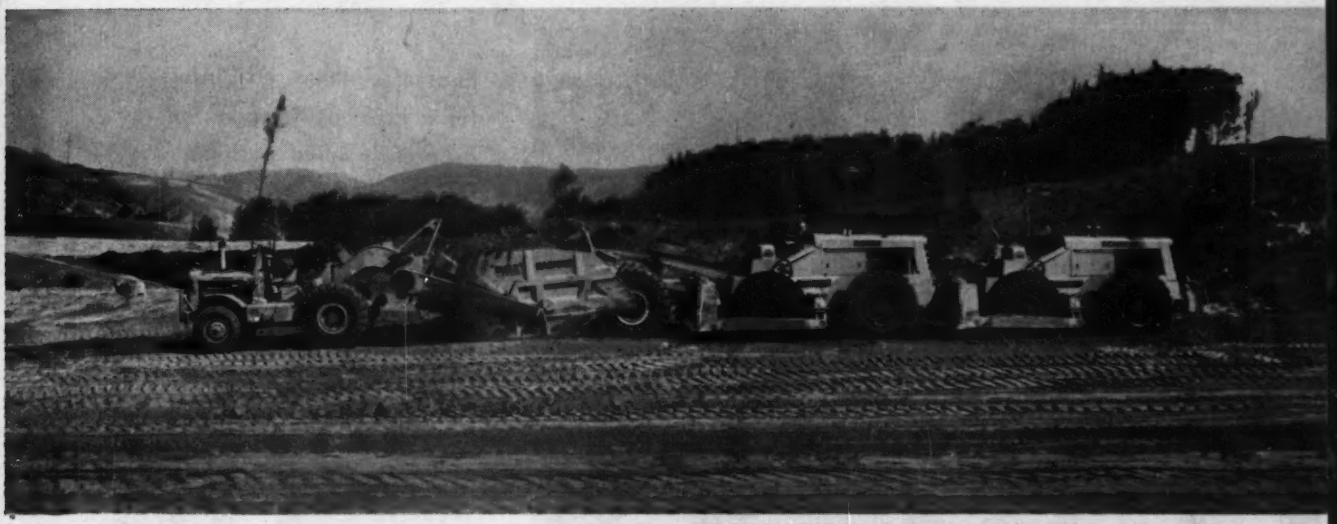
Pushed by the tandem Michigan dozers, the pans are fast in the cut, too. They pick up their 50-yd loads in 30 to 40 sec after pusher contact and leave the pit at close to 15 mph. Loading on a 3-5% downgrade, average pusher cycle is: load, 30 sec; boost, 6 sec; back up, 17 sec; and spot, 7 sec.

When the scrapers are being push-loaded by the rubber tired dozers, the operators take shallow 6 to 8-in. cuts. Both scrapers and dozers move out in second gear range, scrapers shifting into third during the boost portion of the cycle. In these 6 sec, from the time the scraper blade is lifted from the dirt and the bowl is closing, the tandem 380's have increased the pan's speed to 12 to 14 mph.

The rear pusher drops contact with the other one a second or two before the scraper moves out on its own. Then the two tractor dozers wheel back at speeds up to 18 mph.

When the pushers have arrived close to where the next scraper pass is to begin, they angle off the anticipated scraper contact point at 45 deg. They stop about 50 ft from where they actually will touch the scraper's stinger. Then, as the scraper makes its turn into the cut using the pushers as a guide, the tractor dozers move out quickly and smoothly for a pickup on the fly.

Using these techniques, Haskins is moving an impressive amount of dirt fast. In October, for example, 1,250,000 cu yd of compacted fill (90% modified density) went into the housing project. This was for 10-hr days and 6-day weeks. But shut-downs, due mostly to fog, cut actual workweeks to 50-55 hr.



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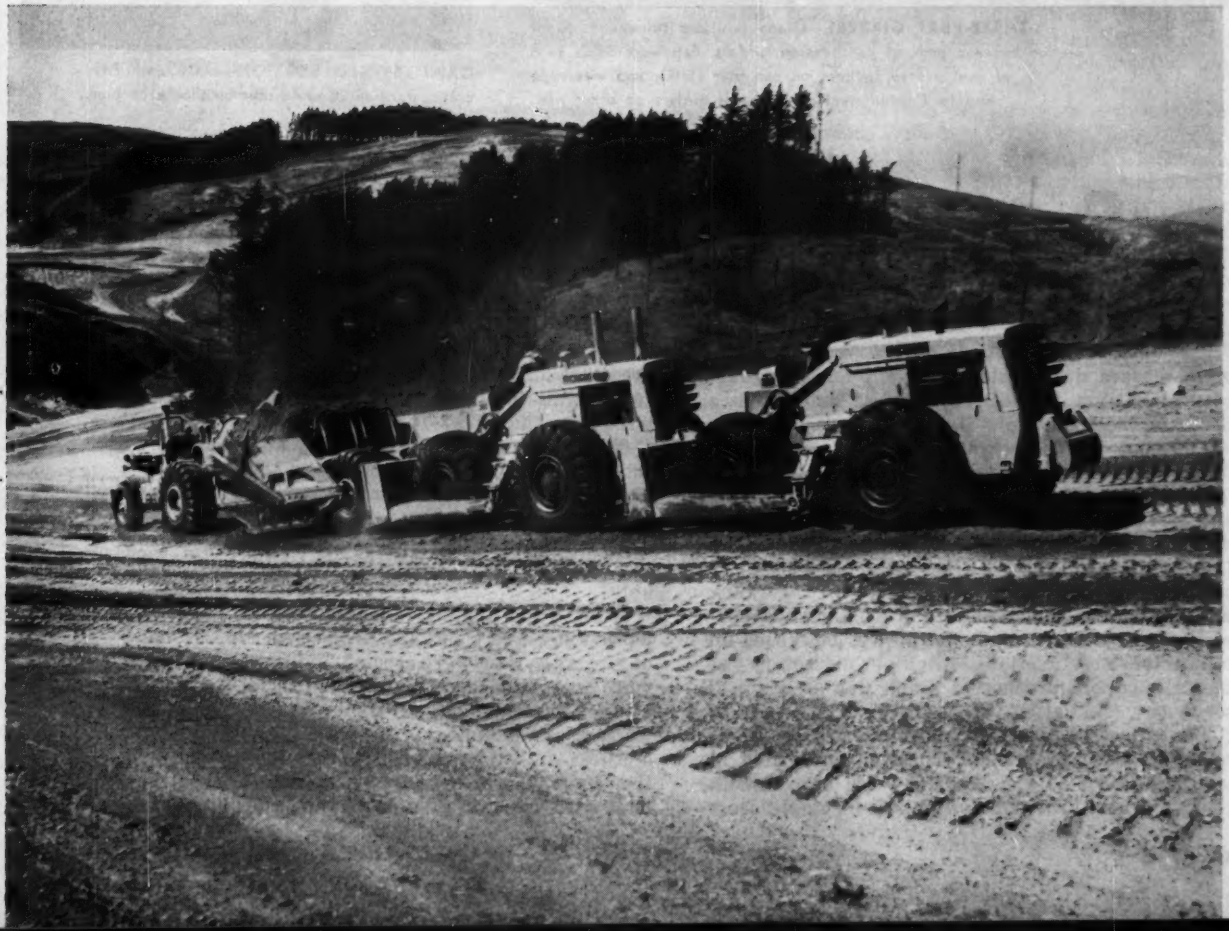
DOWNHILL LOADING—Hilly terrain at Westbourough Homes project between San Bruno and South San Francisco lets earthmovers of Arthur Haskins, Inc. take advantage of favorable grades. Ground is a compacted silty sand that is ripped before loading.

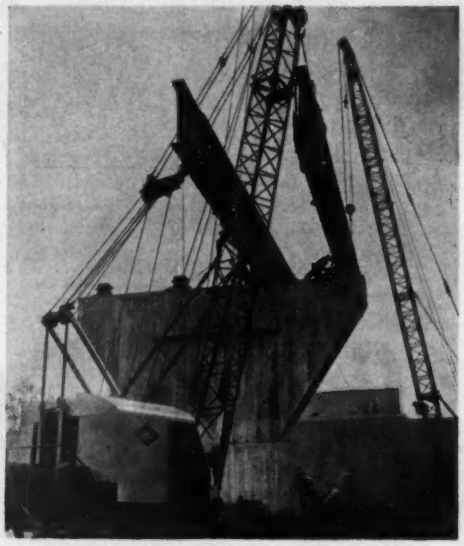
DOUBLE PUSHING—Each of the 430-hp tandem pushers weighs 90,000 lb and has a top speed of 28 mph. The heaped capacity of the scraper has been increased from 35 cu yd to 50 yd by dealer's lengthening of the bowl and adding extra-high sideboards.

Get Fast Push by Wheel Dozers



THREE-PART GIRDERS—Crane positions suspended girder section between ends of cantilevered girders. Falsework holds ends of cantilevered sections on one pier (left), and wire rope tied to 7½-ton steel ingots holds girders on other pier.

Ends of cantilevered girders for a Potomac River bridge rest on prefabricated portable falsework while cranes place additional girders to complete a span. The falsework can be erected to fit any height and is 100% salvageable.



CANTILEVERED SECTION—Lima and P&H cranes position 22-ton girder on shoe atop pier.

Portable Falsework Speeds

PREFABRICATED FALSEWORK holds heavy plate girders during steel erection for the dual-roadway Cabin John Bridge across the Potomac River near Washington, D. C.

The contractor, Ruckman & Hansen, Inc., prefabricated steel pipe columns and bracing for the falsework in their home shop in Fort Wayne, Ind., and assembled it at the job site. The columns and bracing, which can be disassembled easily, are 100% salvageable.

After this project is completed, the falsework will become a permanent part of Ruckman & Hansen's construction equipment and will be reused on other steel erection jobs. All that's necessary for the falsework is a concrete grade slab or beam to serve as a foundation.

The falsework columns can be erected in various configurations and heights. They are fabricated in lengths of 3½, 10 and 20 ft and are braced with 12-in. horizontal I-beams and 4x6-in. angle cross braces. The I-beams are 11½ ft long and the angles are 13 ft long. The pipe is 30 in. in dia and has a ½-in. wall thickness. Ends of the pipe are fitted with 1 in.-thick, 3x3-ft bearing plates.

Gusset plates for cross bracing are attached to three sides of the pipe columns so that the falsework can be erected either as a bent consisting of two or more columns in a line or as a tower consisting of four or more columns. All parts, including the angle and I-beam braces are interchangeable.

At first, the contractor planned to use the falsework extensively on this project to support ends of girders as they were erected and before the spans were completed. But the rugged terrain and lack of working room make it difficult to use the falsework in some spots.

Ruckman & Hansen uses the falsework only in the spans where there is a long time interval between the erection of a girder and the completion

CROSS BRACE—P&H crane (right) holds end of girder while Lima positions brace.

SUSPENDED SECTION—Lima erects suspended section while P&H holds cantilevered one.

Bridge Job

of a span. For girders that are erected and bolted to other girders on the same day, the contractor uses wire rope to tie the ends of the girders to 7½-ton steel ingots placed on the ground.

This arrangement is steady enough for erection, but it is dangerous to leave the 12 to 14-ft-deep girders tied back like this overnight when high winds in the area might knock them down.

Each of the four girders in the span consists of three sections: one cantilevered from each pier and one suspended between them.

Here is the procedure Ruckman & Hansen follows on a typical span where the falsework is used for erection:

First, a falsework bent consisting of four pipe columns in a line is erected atop a concrete grade slab. Column sections of different lengths are combined to get as close to the height of the girder as possible. Timber cribbing on top of the falsework is used to reach the exact elevation of the girder.

Next, Ruckman & Hansen erects four cantilevered girder sections for one roadway of the bridge. The midpoints of the girder sections rest on their permanent shoes atop the piers and their ends are supported on the falsework. Two crawler-mounted cranes, a P&H with a 100-ft boom and a Lima with a 75-foot boom and 15-ft jib, handle the erection.

Then, the contractor erects one cantilevered girder section on the next pier and ties it with wire rope to three steel ingots. Two ingots hold down one end of the section and one ingot counterbalances the other end.

A second girder section is erected next to the first one and tied to it with a cross brace bolted in its permanent position. The P&H crane holds these two sections until the Lima erects a suspended intermediate section to close the gap between the ends of the cantilevered girder sections.

From here the completion of the remaining girders in this span is routine because no temporary anchors or supports other than the falsework are needed. The falsework remains in place until all girders in the span are erected.

This erection procedure is complicated somewhat by the rough terrain at the bridge site and by lack of room for the cranes to maneuver. Also, there is no room for storing girders on the ground as they are delivered by trucks.

This means that Ruckman & Hansen must erect each girder almost as soon as it arrives at the job site. Scheduling girder delivery and the order in which the girders are erected is of utmost importance. But even then a few extra operations are necessary to complete the job.

One is the construction of level areas that the cranes can use during erection. Ruckman & Hansen figured that timber mats for the cranes would be too costly because as much as a 10-ft height of timber would be necessary in some spots. Also, big rocks at the site cannot be leveled off to provide a flat area for the cranes.

To overcome these problems in improving the working areas, Ruckman & Hansen bought some dirt from Talbot Marks Co., Inc., of Clarksville, Va., a contractor who handles earthmoving for the Maryland approaches to the bridge. Talbot Marks hauled in the dirt with Euclid and Caterpillar scarpers and spread it with a D8 to level the areas near the piers. Only one layer of timber on top of the earth pads was needed to support the cranes.

When Ruckman & Hansen reaches the water spans, neither the falsework nor the cranes will be used because a channel of the Potomac River at the bridge site reaches a depth of 90 ft, making it impractical to work from the ground.

For that area, the contractor plans to use derricks that will be erected at the ends of completed spans. A floating derrick also may be used. It would work from pontoons that are similar to those that support a floating construction bridge at the site *(CM&E, August p. 88)*.

In charge of the project for Ruckman & Hansen, Inc., is Keith E. Ulerick, project manager. Ed Wagner is superintendent at the bridge site, and Lee Saunders is steel erection superintendent. District engineer for the Maryland State Roads Commission is W. L. Shook, and J. Buffington is resident engineer.

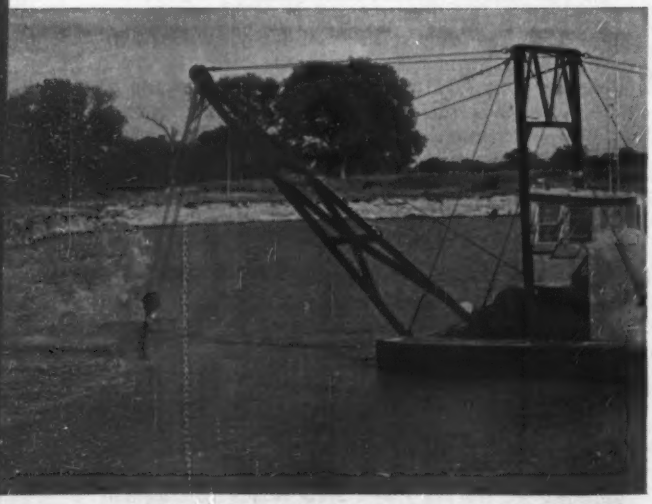
The girders were fabricated by the Nashville Bridge Co. of Bessemer, Ala., and shipped to Washington by rail. Trucks hauled them to the job site.

Although working in wet sand present problems, two Nebraska contractors are finding ways to use the easily compactable material as fill. One dewaters pits with wellpoints, then gets sand with scrapers. The other contractor uses a hydraulic dredge.

PUMP RETURNS WATER—Water is pumped back into the Platte River, away from the work area, by four diesel-powered pumps at each borrow pit. They dewater at rate of 7,000 to 9,000 gpm.

PLUNGING FOR FILL—Cat scrapers barrel into the borrow pit to get fill. Machines and maintenance methods are tested by the sandy water's abrasive effects on scrapers and crawlers.

Contrasting Borrow Techniques



CUTTING A COVE—Making an attractive shoreline is part of the job for the cutterhead hydraulic dredge used by Missouri Valley. The contractor must supply 1 million yd of fill for an interchange, and leave behind a picturesque lake in a 43-acre area that is fed by ground water.

TWO CONTRACTORS working separate sections of a Nebraska Interstate highway job are getting fill material with unusual and contrasting borrow techniques. One must dewater a river and the other is required to create a lake.

Roberts Construction Co. of Lincoln has a contract to build 21 mi of highway on a line that parallels the soggy, sand-filled Platte River. The contractor is dewatering borrow pits that extend 400 ft into the Platte, then using scrapers to get fill. Missouri Valley Construction Co. of Grand Island is building an interchange on higher ground near Grand Island. They are using a hydraulic dredge to get fill, and must leave behind a recreational lake fed by ground water.

To shorten haul distances, Roberts is dewatering 18 borrow pits, each about 2,000 ft long. Ramps are run out of both ends, and sometimes the middle, of each pit to further reduce hauls. Each pit yields about 300,000 yd of fill, although the quantity is determined by haul distance. When hauls exceed 4,500 ft, work moves to another pit.

Roberts is dewatering by ringing each pit with 10 and 12-in. headers and 2-in. Moretrench wellpoints. Subcontractor American Dewatering Corp. has two complete sets of Moretrench equipment in

Supply Road Fill

operation. In leapfrog fashion, one pit is readied while another is worked.

Diesel-powered pumps are set on the river side of a pit to discharge water away from the work. Depending on the rate of flow, from 525 to 550 wellpoints and four or five pumps are needed to dewater a pit. Water is pumped off at the rate of 7,000 to 9,000 gpm. The Platte's unusual flow pattern, made up of numerous fingers and channels, enables American Dewatering to detour the surface flow away from the pits. A sand dike upstream from each pit diverts water into another channel.

In order to work the pits with scrapers, Roberts must dewater in stages, taking water down in horizontal layers over the entire pit. If water was removed quickly to the ultimate depth of the cut—12 to 16 ft—the sand would become too dry to support equipment. Also, the required compaction cannot be achieved readily if the sand is too dry. On the other hand, Roberts found that overly wet sand meant that water would drain from the scrapers, causing haul roads to disintegrate. The contractor discovered that the best traction and compaction is secured when the water level is held at 1 ft below the working surface.

One of Robert's main problems is maintenance

PITS ARE RINGED—Over 500 wellpoints ring each 400 x 2,000-ft pit. Subcontractor American Dewatering Corp. has two sets of Moretrench equipment in action, leapfrogging one ahead of the other as the 18 pits are worked. The 2-in. wellpoints are set on 10 and 12-in. headers.

FILL FLOWS—Fill material comes up with water as the dredge's pipe lifts discharge out of the lake. The Cat D8 levels fill, which achieves its 95% compaction requirement entirely through drainage action. A network of runoff ditches returns water to the man-made lake.

MOVING THE PIPE—Pumping continues as crew prepares to change the point of discharge. An elaborate system of wyes in the line enables the contractor to shift the pipe without interrupting the flow. The dredge's ability to work through bad weather increased production on the job.

of crawler tracks exposed to abrasive sand. Fill is scraped off in level layers to minimize standing pools of sandy water, but crawler tracks still show wear after 400 to 500 hr of work.

To offset these difficulties, Roberts has discovered a number of advantages while working the wet pits.

An obvious advantage is that the contractor has no brush or trees to clear. Nearby land is timbered.

The sand's moisture simplifies compaction. Drainage and walking the fill with haul units provide the 95% density requirement without rollers or tank trucks.

Gradation is no problem. Specs call for 90% of the material to pass a 200 sieve and 10% to be of No. 10 size. The Platte River does its own sizing.

The sand is not usable as top dressing, however, because of its sterility. To get dressing that will support vegetation, Roberts scalps a 5-in. layer of topsoil from the right-of-way and stockpiles it. Some 670,000 yd will top the fill forming the sand embankment.

The job, which includes placing 3,600,000 yd of embankment fill, is being worked with four Cat bottom-dump units and six Cat DW21's. Two D9's and a power shift D8 are used in the pits as pusher units. Two No. 12 motor graders work the haul roads. On the fill itself, a LeTourneau-Westinghouse rubber-tired tractor speeds unloading when necessary.

Missouri Valley Construction Co. is borrowing fill under different conditions, dominated by the requirement that they leave a picturesque lake behind. They are using a cutterhead hydraulic dredge, made by American Machine & Engineering of Daytona Beach, Fla., that has an 18-in. suction line and 16-in. discharge. The contractor must supply a million yards of fill for ramps and an overpass.

Missouri must remove fill from a prescribed 43-acre area in such a way that the site can be used as a recreational area. Although the dredge could dig as deep as 60 ft, specs limit dredging to a 20-ft depth. The contractor also is encouraged to dredge an irregular shoreline with coves and contoured curves to give the lake an attractive outline. When the job is finished, coarse sand will be placed over the shoreline for a beach.

The dredge is pumping through 5,300 ft of discharge pipe. An elaborate system of wyes enables pumping to continue without interruption when pipe sections are moved. Spoil is lifted 20 to 30 ft without a booster pump. Runoff water returns to the lake through a network of ditches.

Missouri Valley must construct one of the ramps for the interchange with fill brought in by scrapers because the ramp's location will not permit water to flow back into the pit being dredged. Superintendent Earl Wilson, comparing work in the wet and dry, finds that on this job dredging is better for several reasons.

For one thing, the dredge is immune to bad weather. When rain bogs down land equipment, the dredge works on. Compaction also is easier, since return flows wash off the fines, leaving sand that interlocks. Thus, the 95% compaction requirement is achieved through drainage action. When a heavy rig runs over the fill after water drains, it leaves only a barely discernible tire print.

Another advantage to dredging is labor efficiency. Seven men work one of two 12-hr shifts with the dredge and eight work the other shift. On the ramp, 18 men work a D21 spread.

Wilson adds that while working with scrapers is faster than dredging for fill, the longer season and less downtime should balance production averages.

W. E. Swanson is project manager for Roberts. Harold McMullen is project coordinator, Ed Clements is project superintendent, and John Klaasmeyer is grading superintendent. Sam Olsen is office manager.

For Missouri Valley, Bill Grewcock is general manager and Leonard Miller is bridge superintendent.

Steel bracing between two rows of sheet piles driven to protect the excavation for a concrete retaining wall forced the contractor to form and pour the wall around the bracing. Later, timber struts held the sheeting as the steel bracing was removed and the boxed-out sections of the wall were concreted.

Concrete Wall Built Around Sheet Pile Bracing

THE ONLY WAY to brace two rows of sheet piles that were driven to protect the excavation for a concrete wall was to install steel struts between them. Then the contractor had to build the wall around the bracing.

The retaining wall, part of an aluminum rolling mill expansion project at Fairmont, W. Va., is 38 ft high and 280 ft long. It will serve as a structural wall for the plant and also protect a nearby road.

Because the wall is only a few feet from the road, the contractor, Schurman Co., Inc., of Huntington, W. Va., could not anchor the sheet piles externally. Instead, he installed two levels of H-beam struts between the sheeting walls and formed and poured the retaining wall around the bracing, leaving openings for the struts.

Schurman drove the sheeting along templets made of 10-in. H-piles and H-beams. The 30-ft-long piles were on 25-ft centers and the beams were attached to them. A special hairpin hammer developing 16,000 ft-lb per blow drove the H-piles and tacked the sheets, which were set in pairs. The hammer has an internal anvil that rests atop both sheets in a pair and reduces damage to them.

Project engineer for Schurman was B. Scearcy; project superintendent was Q. L. Ballard. All piles and steel bracing were supplied by the L. B. Foster Co.

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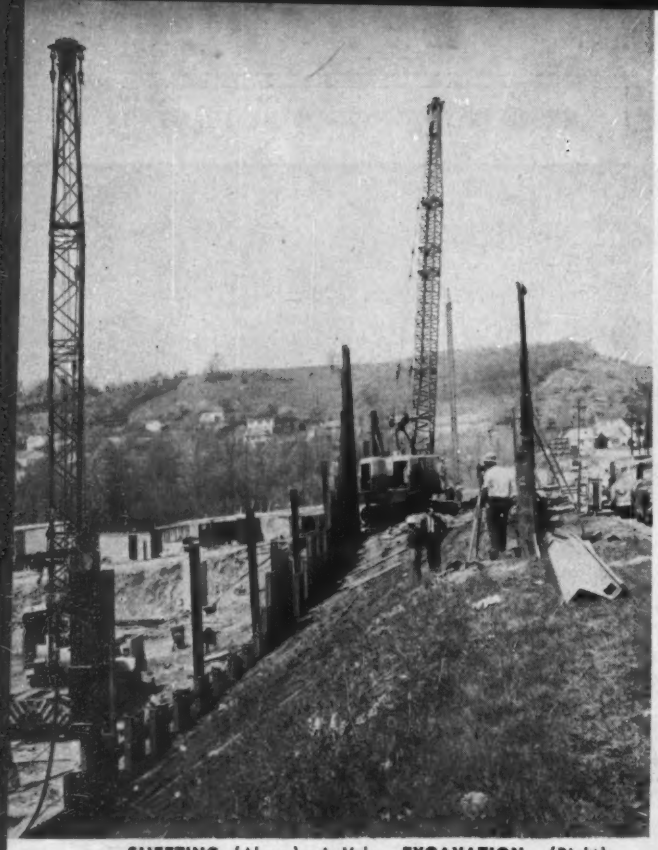
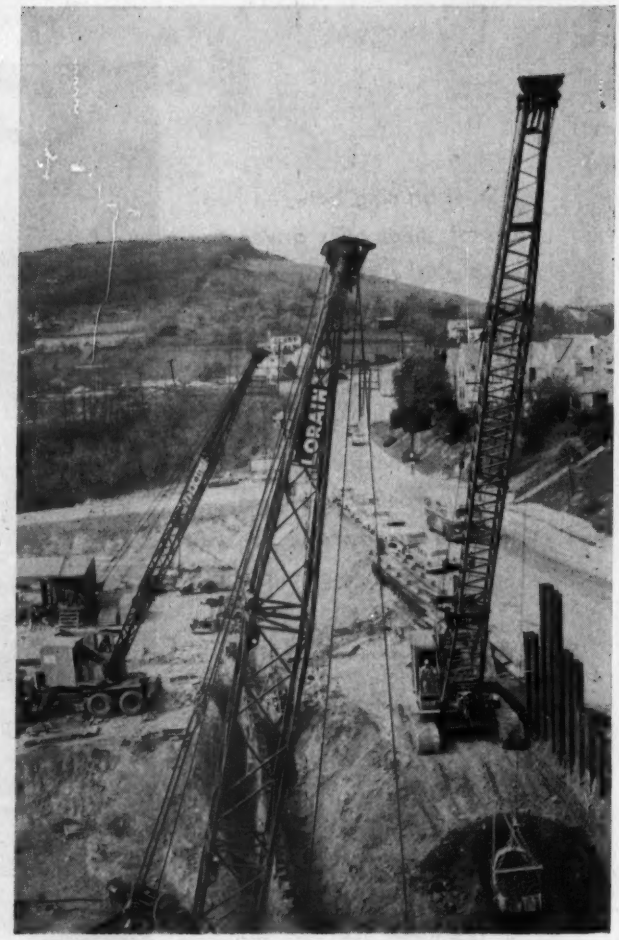
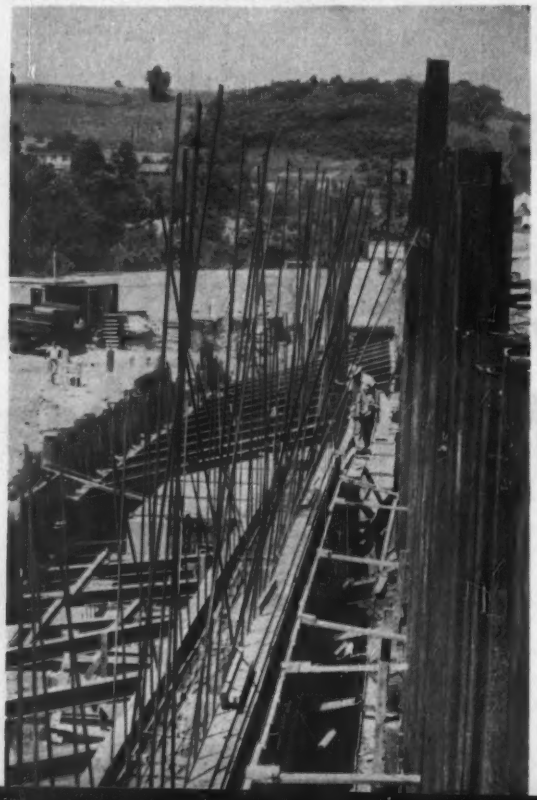


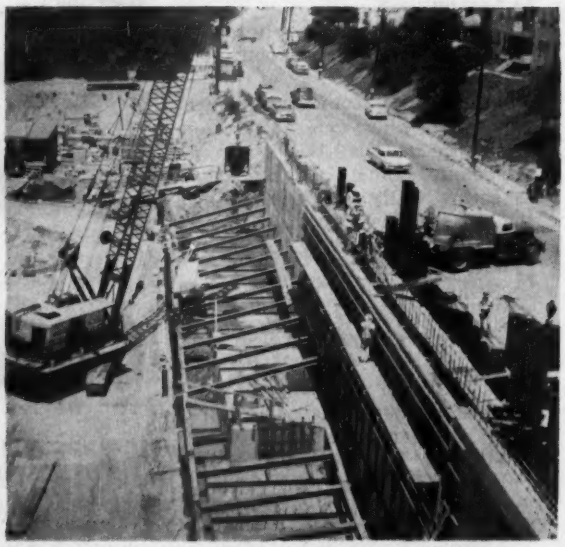
SHEETING (Above)—A Vulcan hammer on Lorain truck crane drives L. B. Foster MZ-27 interlocking sheet piles along lower wall, while a Bucyrus-Erie 38B crawler crane sets 55-ft-long MZ-38 sheet piles for wall at top of embankment.



EXCAVATION (Right) — Cranes equipped with dragline and clamshell buckets excavate 37-ft-wide area between rows of sheet piles. At first, the contractor removes only enough dirt to make room for first level of cross bracing.

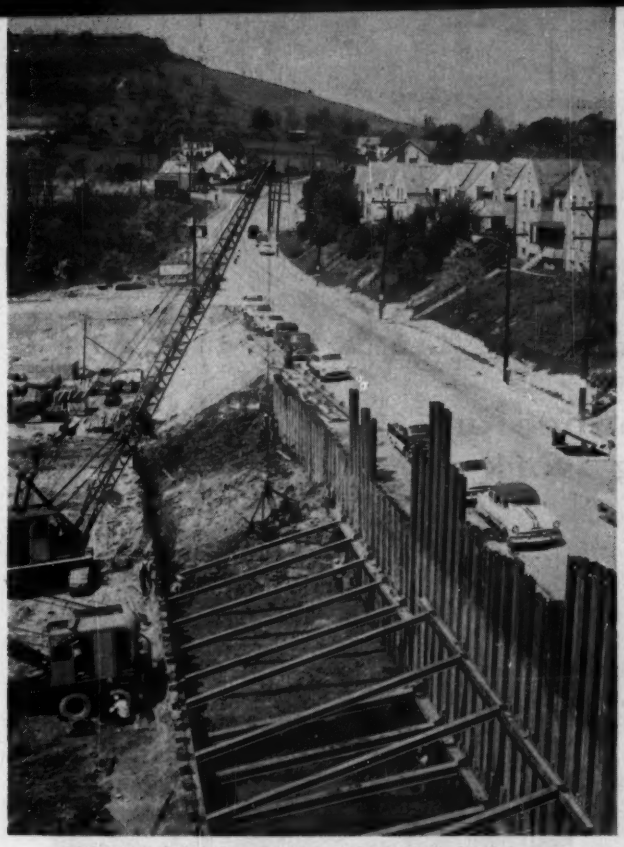
CONCRETE WALL . . . *continued*





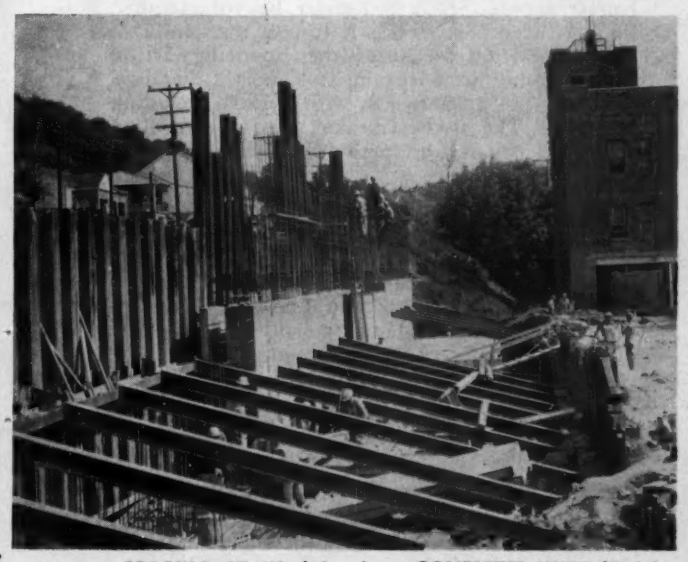
WALL RISES (Left) —Reinforcing and forms for the 38-ft-high retaining wall rise above excavation, while cross bracing passes through concrete wall to hold sheet piling in place until the wall is completed and the excavation is backfiilled.

FILLS FORMS (Above)—Bucyrus-Erie crane swings bucket to place concrete mix delivered by transit mixer. The foundation and the lower parts of the wall were concreted by chuting the mix directly from the truck mixers into the concrete forms.

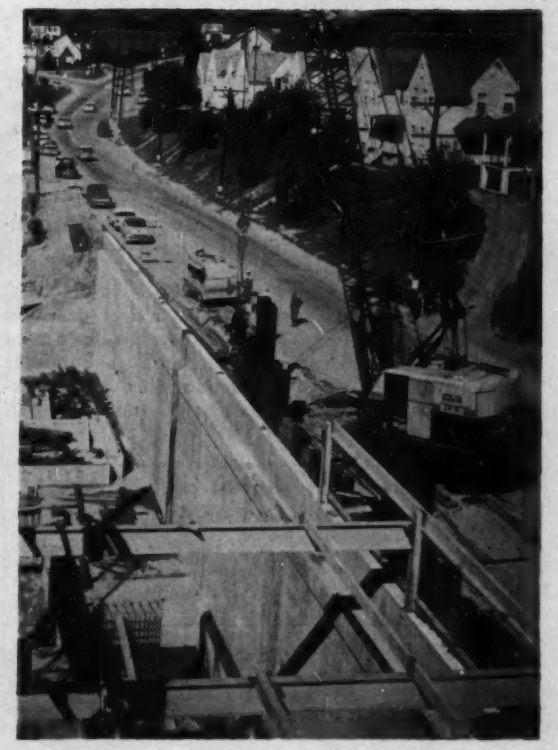


BRACING (Above)—Struts between sheet pile walls are 12-in. WF beams placed on 14-ft centers on 30-deg slope. After top level of bracing is placed, clamshell continues excavation to make room for wales and struts in lower-level bracing.

FORMING (Right)—Forms and rebars for retaining wall are placed under, around, and over steel struts. Holes in wall are concreted only after wall is completed, temporary bracing is placed, and excavation is backfilled to level of struts.



BRACING STAYS (Above)—Both levels of cross bracing remain in place during wall construction. When completed, the 280-ft-long retaining wall will protect an adjacent road and will also serve as a structural wall for an aluminum rolling mill.



COMPLETED WALL (Right)—Crane pulls sheet piles after wall is completed and excavation along outside of wall is backfilled. Temporary 12x12 timber struts between the wall and the sheet piles braced the sheeting while the struts were removed.

No. 5 in a series of announcements on new **HOUGH** *machines*

This new 60-ton tractor is so different there is

nothing like it

in design, or in performance on push-loading and dozing work

For two years on several multi-million-yard earth-moving jobs a new idea in push-loading has been under extensive and sustained operation behind a variety of scrapers. This new idea is the HOUGH D-500 PAYDOZER — a different and better kind of rubber-tired pusher and dozer as shown by its performance on these projects.

More Power. A 700 hp turbo-charged V-12 Cummins diesel is governed to 2100 rpm and 600 hp for longer life and lower maintenance. Two newly-developed, high-efficiency dry-type air cleaners plus filtration of all oil circuits are provided.

Articulated Hydraulic Steering is one of the most unusual features and gives exceptional maneuverability. The turning radius is under 25-ft.—considerably less than its overall length and one-third less than a comparable unit with rear-steer. The rear wheels always track the front ones and always follow in the path cut. Combined with 30° rear-axle oscillation, this articulated steering keeps "all four feet" on the ground and also permits a twisting "walk-out" action in poor footing.

Wide-range Drawbar Horsepower. The power train includes a 3-stage, single phase, torque converter, a HOUGH-built full-power-shift transmission, power-transfer differentials in *both* axles and planetary hubs in all wheels. This drive train provides 80% of peak draw-bar horsepower over 75% of the entire speed range so it can push-load efficiently with a wider range of scraper sizes.

Three-way Blade and Push Block. Blade is 160" wide—extending 10" beyond the wheel path on each side, and has special reinforced center area for pushing. Six-way hydraulic control includes raise, lower, tilt to each side, forward and backward pitch. Modified wings help retain the load

while adjustable stabilizer shoes permit precise grade control. A separate pusher block is optional.

Unusual Stability and Smooth Riding are features the operator will notice and appreciate. These are achieved by the approved use of dry ballast material (100% heavier by volume than liquid) in all four tires. It lowers the center of gravity and also reduces the bouncing action usually found in unsprung machines. Standard tires are 33.5 x 33-26 PR, with options including 37.5 x 33. The 4-wheel brakes are air- controlled with dual pedals for operator convenience.

High Availability. One example of the many extra features in this unit to keep it profitably at work and reduce downtime is the separate fan-cooled oil-to-air cooler to effectively control transmission-converter oil temperatures. Full-shift fuel capacity is provided. An optional central lubrication system can be furnished that automatically lubricates 27 different points every 30 minutes of operation.

Your HOUGH Distributor is ready to show you why there is nothing like the D-500 PAYDOZER.

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706 Sunnyside Avenue, Libertyville, Ill.

Please furnish complete data on the D-500 PAYDOZER

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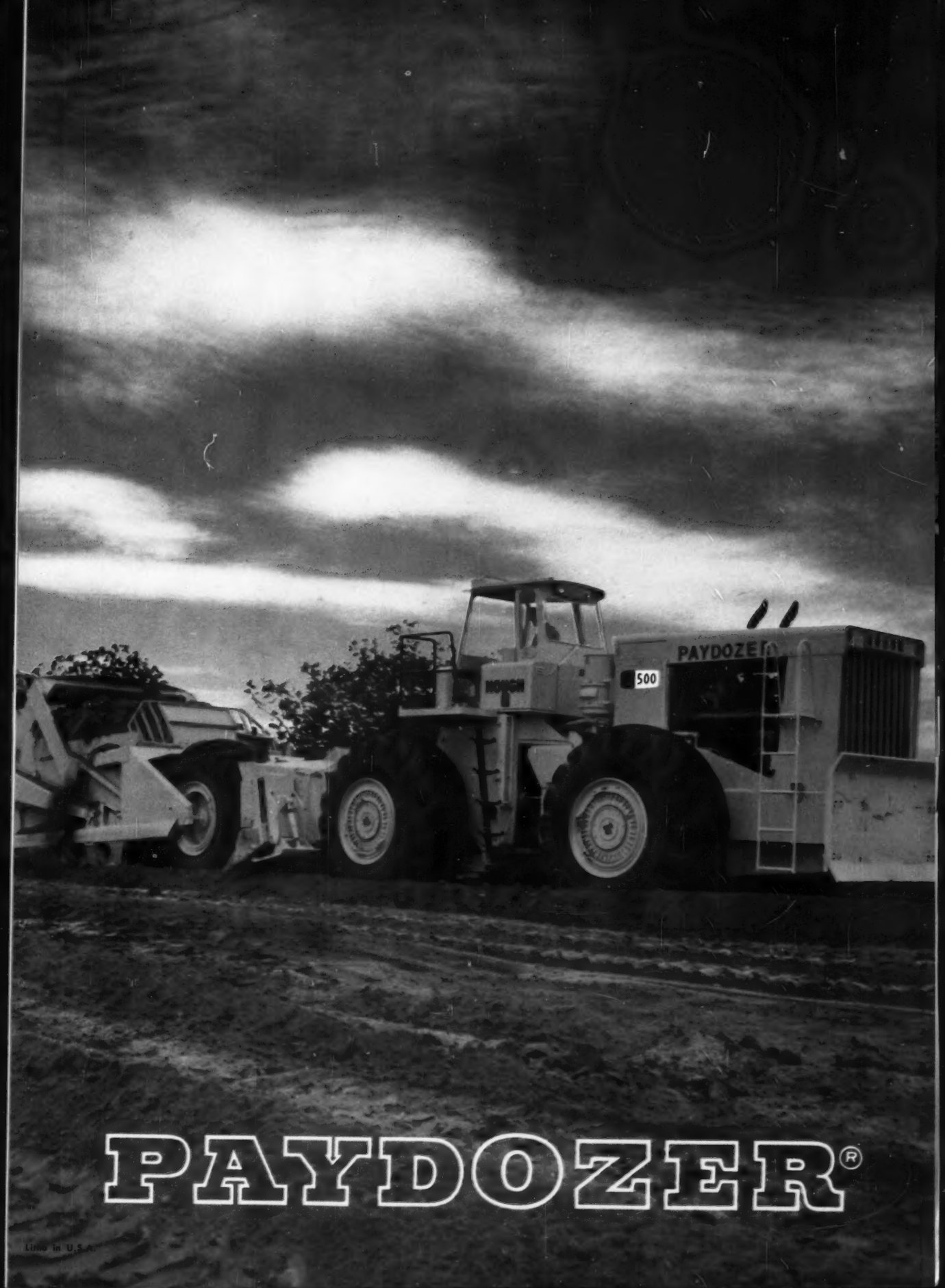

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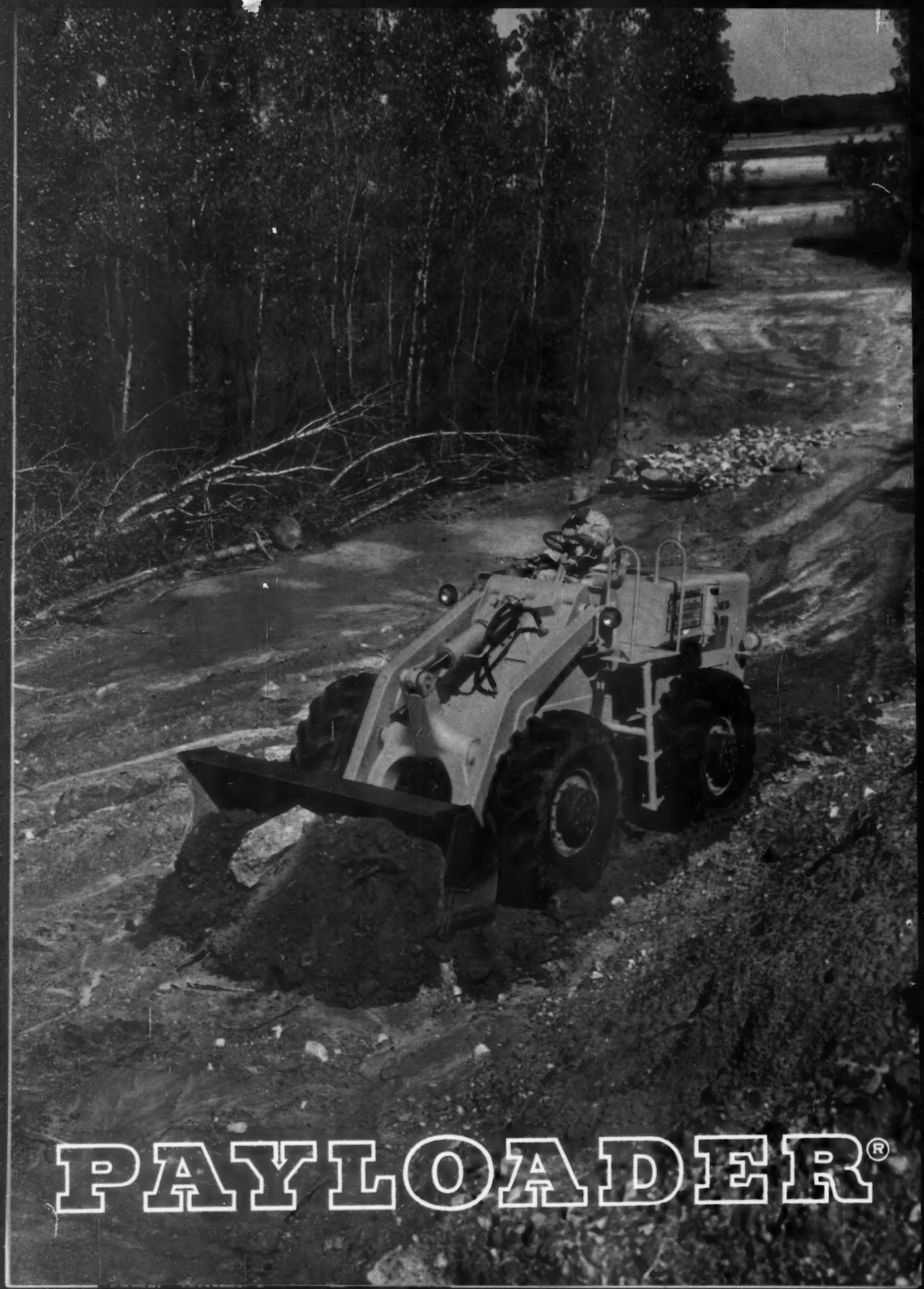
PAYLOADER®

Before you buy any tractor-shovel in the 2 to 3 cu. yd. class consider the

availability

designed into this new Model H-70C

You can't make money when your equipment is idle. "Down-time" is more costly in terms of lost production or yardage than it is in repair and parts costs. Machine availability—time *on* the job—is therefore one of the most important considerations when selecting any piece of equipment.

That is why HOUGH engineers have designed into this new H-70C, features that insure maximum job availability . . . features made possible only by HOUGH's long, extensive experience . . . features not found in any other tractor-shovel in the industry.

Heavy-duty Design and Construction: This new H-70C weighs a full 22,000 lbs. without ballast, and is built around a massive structural steel frame—twist-proof and shock-proof—to keep all components in alignment. The huge, heavy-duty axles specifically designed for tractor-shovel service, the precision-engineered HOUGH-built transmission, the dependable engine with plenty of reserve power, and the most effective hydraulic system, all combine to provide utmost dependability and freedom from breakdown on the job. And in addition, in the production and assembly of all HOUGH machines, components and complete machines are fully tested by the most modern scientific instruments available—including final chassis dynamometer testing.

Less Maintenance Required: The simplicity of PAYLOADER design, plus the special attention given to protecting points of normal wear, cut "down-time" and maintenance costs tremendously. The simplified boom mechanism has as many as ten fewer pivot and grease points than other tractor-shovels, which means fewer parts to service and maintain.

A single bucket-control cylinder cuts in half the number of cylinders, piping, hoses, linkages and wear points found on all other tractor-shovels. In addition, pivot points on boom, bucket mechanism and steering are fitted with "O" rings and other seals that keep dirt out and grease in.

Front wheel brakes are sealed against dust and dirt. The hydraulic system is closed and pressure-controlled to exclude even air-borne dust and moisture. A large-capacity two-stage, dry type, air cleaner protects the engine even under adverse conditions.

Faster and Easier to Service: No other tractor-shovel provides the easy, time-saving access to all machine components for inspection, service, repair or maintenance. Large, removable engine side covers expose the entire engine for easy access unobstructed by fenders, hydraulic cylinders or other components. Easily-removed access panels allow quick checking of oil levels, checking and adjustment of operating and hydraulic controls, batteries and other essential components. The low fuel tank refills from ground level—has full-shift capacity.

The cylindrical-vessel-type oil reservoir is outside-mounted and has a full-diameter cover that is easily removed for complete inspection and servicing of its two full-flow micronic filters.

Only a PAYLOADER gives you simplicity of design, the built-in protective features, the ease of accessibility that means more hours on the job, and also more yardage per hour. Only the model H-70C gives you a tractor-shovel with all these PAYLOADER advantages, plus more horsepower per pound, more dumping clearance and more reach than the average of all tractor-shovels in its class. Your HOUGH Distributor will be glad to tell you more about it and show you what it can do.

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
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"Our 48 Ford Trucks have given maximum economy in every way!"

says Fred Newkirk, Manager of Materials Transportation Company, Inc., Corpus Christi, Texas

"We are using Ford Trucks exclusively because they provide important savings—starting with a lower initial expenditure. We estimate that each Ford costs us about $1,500 less than other makes of comparable size and capacity. Our maintenance and repair costs are less, too. The greater parts interchangeability on Ford Trucks makes it possible to reduce our parts inventory by about 50%; this frees $2,500 of working capital. And in operating expenses, we save on gasoline because our Fords deliver an extra ½ mile per gallon.

"They have proven more durable, too. For example, our 1958 Ford F-1000 has logged over 160,000 miles without even having the heads or pan off. We expect 200,000 miles from these Super Duties before a major overhaul. Some of our 1955 and 1956 Ford F-900's still have their original brake linings after 300,000 miles.

"Our trucks operate six days a week, and the average fleet mileage is 51,000 miles per week. We haul 48,000-lb. payloads of bulk cement or 37,760-lb. payloads of sack cement for Halliburton Portland Cement Company. Our drivers are also very enthusiastic about these new Ford Super Duties. They report that with 72,000-lb. grosses Fords are smooth riding and easy to handle."

Solid testimony that Ford's full-time economy only starts with low price!

FORD TRUCKS COST LESS

PRODUCTS OF Ford MOTOR COMPANY

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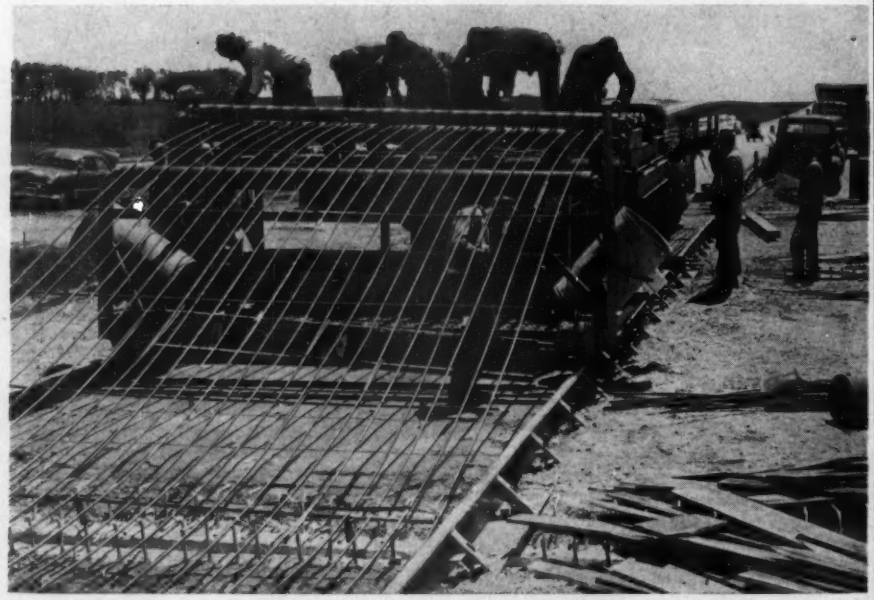
Home-Made Rigs Place Continuous Reinforcing...



Mat Drops into Forms From Moving Truck

Two photos, right, show ⅝-in. bars unrolling from flat-bed truck. As rig moves in 4-ft increments, five men guide bars into 24 sheaves. Bars are wire-tied then pass second sheaves and two rollers. Lateral bars go in 4 ft c-c, and man on ground positions three metal chairs to support reinforcing mat. In best day, crew placed 4,000 lin ft in 10 hr; average was 340 ft per hr.

Conveyor Spills Mix Across 12-Ft Width

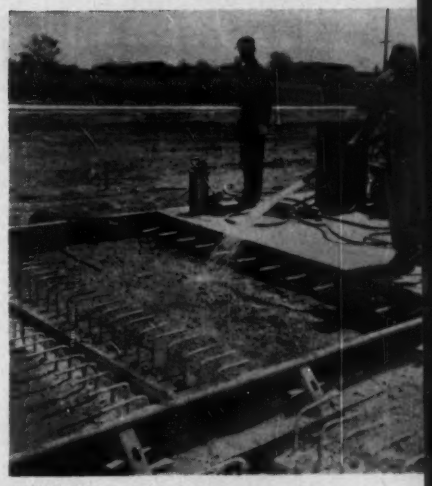
Four-wheel-drive truck, lengthened to 40-ft, transports 36-in.-wide belt conveyor pivoted at its front. Truck with Agitor body feeds 6.8 yd of concrete to belt as hydraulic ram swings conveyor to drop concrete into forms. Adjustable side-mounted screed strikes off surface. Propelled by Chrysler engine, concrete machine mounts Onan electric plant that runs motors powering conveyor and hydraulic pump. Finishing machines trail concreting rig, which eliminates conventional spreader.

...and Spread Concrete

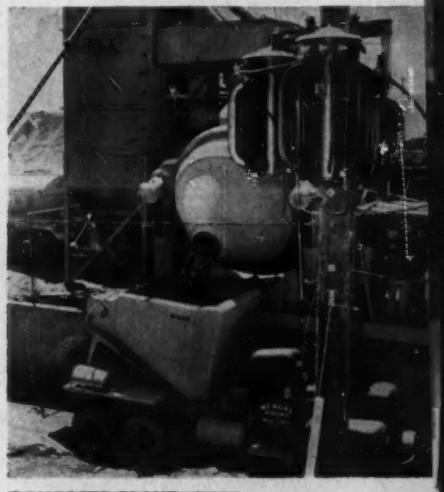
TO PAVE 4.2 mi of continuously reinforced highway on Wisconsin's Interstate I-90, F. F. Mengel Co. designed and built two fast and smooth-working machines. One rig, mounted on a modified flat-bed truck, placed 24 40-ft rebars at a time along 12-ft-wide lanes. Men on the truck staggered the bars and tied them. Transverse bars were added 4 ft c-c before the mat settled between 8-in.-deep forms.

The second rig, built on a lengthened four-wheel-drive chassis, placed concrete from a pivoting belt conveyor. A hydraulic, side-mounted screed on the concreting unit struck-off mix at top of forms. Concrete was delivered to the conveyor by dump trucks from the contractor's own batch plant 4 mi away.

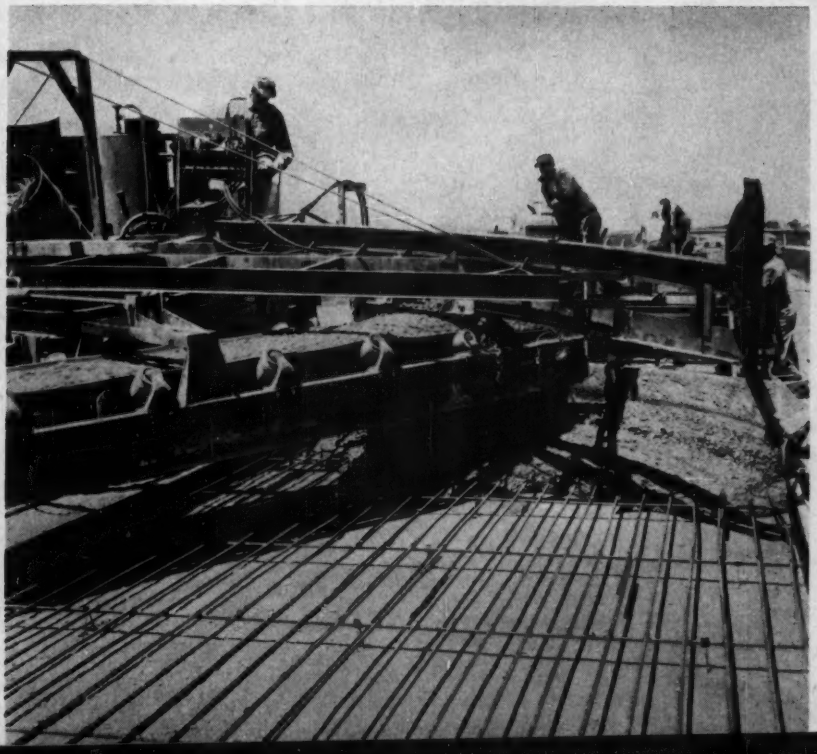
Built under a $762,000 contract, the twin 24-ft pavements near Madison will serve as test sections for comparison with a nearby highway reinforced with wire mesh.

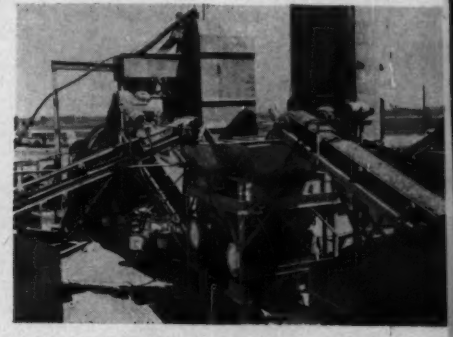


ANCHOR—Stirrups sunk in concrete keep bars from moving lengthwise. Four anchors hold both ends of each 12-ft lane. Shear-transfer device carries loads past construction joint.



CONCRETE PLANT—Mixer pours 6.8-yd batch of concrete to Agitor truck. Push-button operated and electrically powered, plant mixed concrete for 2½ min prior to 4-mi haul.





CONVEYORS—Three 24-in.-wide belts carry sand and two sizes of aggregates to Rex weigh hoppers. Trough belt takes material to mixer. Entire plant is wheel-mounted.

NEW METHODS, NEW MACHINES PUT SECTIONS OF INTERSTATE

40% AHEAD OF SCHEDULE...

Tandem loading with new power shift D9G speeds job for Greer Bros. & Young

The job is a big one: 5,000,000 yards to be moved on two adjoining sections of Interstate 75, just out of Jellico, Tenn. Terrain: hilly. Haul distance: 1600 feet. Soil: mostly clay and shale, with considerable ripping required. Time schedule: 300 days.

The London, Ky., firm has teamed new machines with new methods to meet the challenge. For example, the use of tandem pushers has resulted in 21 bank-yards (on adverse grades) in .6 to .8 of a minute. In this case, a new 385 HP Cat D9G Tractor was used in tandem with a D8H to load out new Cat 631 Tractor Scrapers.

"Tandem loading production has been boosted 25% with this D9G, as compared with an older torque converter D9," reports W. C. Howard, chief engineer on the job.

"We notice a big difference in power, weight and traction with this new machine. Cushion bulldozer and push block help, too. They give us on-the-go scraper contact—this cuts down on approach time. By reducing contact shock, we expect better scraper life. Tandem loading with the new D9G has helped us pull 40% ahead of schedule."

The new D9G has a number of pluses that make it right for dozing and ripping, as well as pushing. Here are only a few:

Engine delivers 385 flywheel HP—100 more horsepower than the first D9 . . . weight is 64,800 pounds, 14% more than the first D9 . . . a massive, heavy-duty undercarriage lets the D9G take on the toughest ripping job . . . a power train with built-in ruggedness also has unit construction for fast servicing.

The D9G has Torque Divider Power Shift as standard equipment. This exclusive Cat feature combines the efficiency and snap of direct drive with the load-matching and anti-stall characteristics of torque converter. A single lever gives the operator finger-tip control of his machine. It means faster cycle times and greater efficiency. You get more out of the machine all day.

There's only one way to evaluate the D9G. Check it on the job. Your Caterpillar Dealer will be glad to make arrangements.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

Greer Bros. & Young also use the D9G, equipped with 9C Dozer, to clean up the cut.

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"I don't know who you are.

I don't know your company.

I don't know your company's product.

I don't know what your company stands for.

I don't know your company's customers.

I don't know your company's record.

I don't know your company's reputation.

Now—what was it you wanted to sell me?"

MORAL:
Sales start before your salesman calls—with business publication advertising.

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FOR HIGH-STRENGTH OPEN WEB STEEL JOISTS

This 52-page reference manual, reflecting the recently adopted changes in specifications and load tables for three series of high-strength joists, *replaces all previous standards.* The new specifications and load tables cover three series of joists:

J-Series (replacing the old S-Series), based on a design stress in tension of 22,000 psi

LA-Series (replacing the old L-Series), longspan joists compatible with the new J-Series

H-Series (completely new), high-strength joists made from 50,000 psi minimum yield strength steel

This single edition contains all the information needed for the easy, accurate specification of joists to carry uniform loads on spans of up to 96 feet.

Complimentary copies are available on request.

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Please send me a complimentary copy of the 1962 edition of the Standard Specifications and Load Tables.

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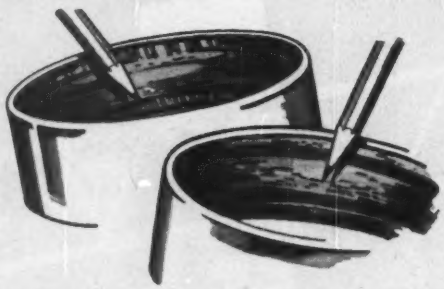
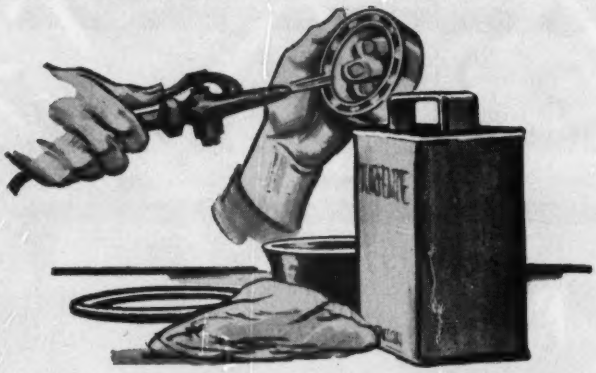
DISTRIBUTOR DAN, the SKF bearing man, shows

HOW TO PROTECT YOUR BEARINGS IN THE FIELD



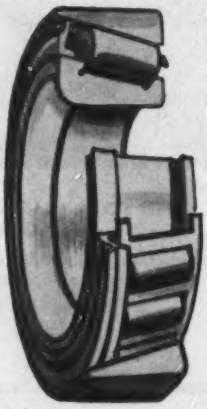
DIRT AND MOISTURE DID THE DAMAGE. The bearing ring on the left failed prematurely because fine dirt particles acted as an abrasive, causing wear. The bearing on the right had to be replaced because of the abrasive action of rust.



START WITH PROPER STORAGE. New bearings come wrapped in dustproof paper. If this wrapping is opened or torn, wash the bearing. Use a clean pail of kerosene or light oil. Dry bearing with compressed air, then dip in anti-rust compound, rewrap and box.

LOVE THAT LUBRICANT and those oil cans and grease guns! Clean oil and grease will carry dirt out when they purge the old lubricant. Whereas, dirty oil and grease carry dirt with them into the bearing. So keep your lubricating equipment clean and don't use lubricants that have been exposed to dust and dirt.

SAVE YOURSELF SEAL TROUBLE. Replace bent or worn seals (which allow dirt to enter) when you install or inspect bearings. You can now get tight, effective double-lipped TySeal tapered roller bearings that fit exactly the same space as standard unsealed tapered roller bearings.



A BEARING IS A BARGAIN! For relatively little money you get a bearing that's made of fine steel which has been heat treated, machined, polished, tested and checked over 100 times. Treat your bearings right and they'll give you the thousands of hours of operation for which they're engineered.

BEAR DOWN ON BEARING DOWNTIME—RELY ON THE TECHNICAL SERVICE OF AUTHORIZED SKF DISTRIBUTORS

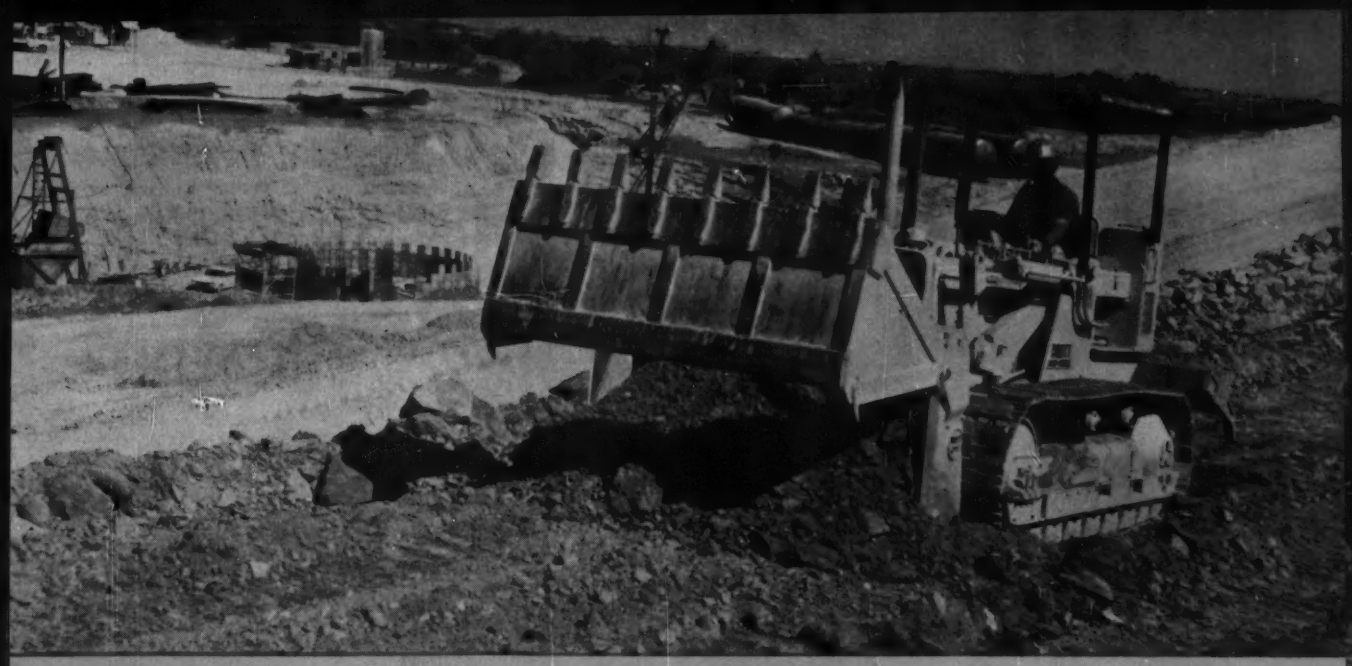
SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

6113

Circle 80 on Reader Service Card

Circle 81 on Reader Service Card



Only the clam-action 4-in-1 converts into a full-sized, full-capacity depth-controlled bulldozer. Simply open the clam, set blade segment to cut, and roll the earth—as this International Drott TD-9 Four-in-One does, leveling spoil at a Texas missile base.

Only 4-in-1 instant "convert-ability" *multiplies your earning power!*

Prove the finger-tip ease and profit-ability of instantly converting the 4-in-1 to get the actions you need. Prove that only 4-in-1 "convert-ability" multiplies your earning power—that you can't afford to own a "one-job" limited-duty loader. Let your International Drott Distributor demonstrate!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Only the "bucket with the bite" can convert into a go-anywhere "grabhook"—that lets you sit and clam-on to hard-to-handle materials like stumps, brush, or boulders—to pile or load them under positive one-man control!

No other loader converts and positions for "back-drag" grading action—to streamline bank-shaping or sloping, above or below ground level—or to pull down materials wholesale on stockpiles or in pits. Only 20 minutes with this 4-in-1 saved two days of hand labor here!

Only bucket on the market that converts into a "carry-type" scraper, the 4-in-1 lets you grade with inch-close accuracy, and boil-in material on the go. This TD-9 Four-in-One, grading grounds of a new building, gets jobs that require a variety of machine applications!

Planet-Drive "25" advantages add up fast—"feeding" 400-ton-per-hour aggregate plants

"400 tons of pit run gravel pushed into the conveyor daily—sometimes on pushes of 200—300 feet—is great production, and we are happy," states Ken Blattner, for D. H. Blattner & Sons, Albany, Minnesota. "The big TD-25 dozer gets its load faster, carries it along without wasting its power in steering —and it completes cycles faster and easier than we believed possible."

You see first-hand what happens when crawler "half-stopping" and load-dropping are eliminated —the first time you watch an International TD-25 round a curve under full load. You don't brake a track and half-kill your power to steer. "Dead-track drag" is eliminated—"live track" Planet Power-steering gives full-power momentum, full time.

Bank-cutting bladesful of gravel without nosing into the bank or sluing is another yardage-adding dividend of Planet Power steering. You equalize offset loading, keep full hp producing, with ease. Simply power-shift the "25's" load-side track to high speed range—leave the other track in low range—and take full bites where clutch-steered rigs only "nibble."

Use Planet Power steering to power-shift up on-the-go (wherever possible) or—power-shift down (wherever necessary)—to get maximum speed on every push. And you do it with a *standard equipment* feature. Hi-Lo power-shifting is another built-in bonus of the TD-25's planetary system!

With exclusive International DT-817 engine wallop, the "25" slugs along, 230 Turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes. No wonder single TD-25's, time and again, are feeding 400-ton-per-hr. aggregate plants!

See how fast Planet-Drive "25" advantages add up—in producing aggregates at minimum cost—as well as on heaviest bulldozing or push-loading. Prove what it means in production and profit to get TD-25 four-speed torque-converter efficiency range control. Let your International Construction Equipment Distributor demonstrate!

International*® *Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

Because the TD-25 can side-cut gravel without time waste and has "live track" steering to deliver full loads to the crusher, this plant is in the 400-ton-per-hour class. The job: W. Hodgman & Sons, Inc., Fairmont, Minnesota, producing gravel for an experimental stretch of soil cement base state road.

With blade built-up to six feet high, this TD-25 (at 7,800 ft. altitude) drifts huge loads of gravel into the batch plant—maintains production of 410 tons per hour with ease. Fast TD-25 reversing up the steepest grades speeds the shuttle-cycle, increases capacity. Owner: Northwestern Engineering Co., Denver, Colorado—working on an Interstate road contract east of Evanston, Wyoming.

Circle 83 on Reader Service Card

Twin-engine rigs can't beat Payscraper® yardage!

"Hauling to a fill up a 5% grade, the International 295 Payscraper travels and dumps as fast as our twin-engine scrapers—matches their yardage, too!"

R. H. Godwin, Sup't
C. C. Mangum, Inc.
Raleigh, N. C.

"Production of our 495 Payscraper is equal to the twin-engine units running in the same cycle. The 495 is an ideal long-haul rig!"

W. W. Gibson, V. P.
Gibson Construction Co.
Donalsonville, Ga.

Two separate earthmoving jobs, involving big yardage and long hauls, recently compared dirt-on-fill production of big-capacity scrapers. Results were startling. On one job, a 2-axle International 295 Payscraper matched a comparable-size twin-engine rig yard for yard. On the other job, production figures told the contractor he equalled twin-engine scraper production with his less expensive 3-axle International 495 Payscraper—and at a much lower operating cost!

Power is put to better use in the Payscraper to give you a quick-loading, fast-hauling, clean-dumping rig. In the cut, large planet gears in the final drive handle full torque loads imposed by the turbo-charged 375-hp diesel engine, while the 7-speed power shift transmission adjusts torque and load to speed, gets you out fast. On the haul road, positive power control of all operations, with speeds to 33 mph, permits full performance with heaped loads. Exclusive rack-and-pinion design and forward spindle pitch turns the 295 Payscraper safely, with automotive ease. At the dumping site, the big 94-in. apron opening and two ejector plate push members assure positive ejection of the whole 34-yd. load. Positive, pto-driven cable control unit is finger tip controlled.

Compare loading, roading and dumping cycles with any other rig, and you'll see how Payscraper efficiency increases earthmoving profits. Call your International Construction Equipment Distributor today and let him show you what the 2-axle 295 or the 3-axle 495 can do on your job!

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

Circle 84 on Reader Service Card

"Perfect performance under conditions that would ruin most engines!"

West Texas Construction Co. again selects International UDT-817 for primary power

Profitable experience with International power led this Texas roadbuilder to specify IH diesel power for his latest crushing plant. This heavy-duty operation calls for reducing caliche for road base. A small percentage of material from the pit is already "fine enough to float" and this creates considerable dust around the crusher. Some engines would choke to death in this atmosphere, but clean-breathing, super-sealed Internationals keep going for years.

"Conditions that would ruin most engines don't seem to bother our 817," says Foreman Al Harris. "We work continually in abrasive dust that often covers the engine and crusher so you can't see them. We haven't lost a minute from this engine in two years of steady operation at 300 yards per hour. Performance has been perfect!"

You put more dollars in the profit column with that kind of dependability—no repairs, no downtime, no headaches, no complications—just steady, economical power, day in and day out. Let your International Engine Distributor or Dealer show you how IH power can work for you. He'll give you full information on 62 models in the IH line—8 to 385 max. hp—stripped engines to complete power units. Call him today!

INTERNATIONAL®
IH ENGINES

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

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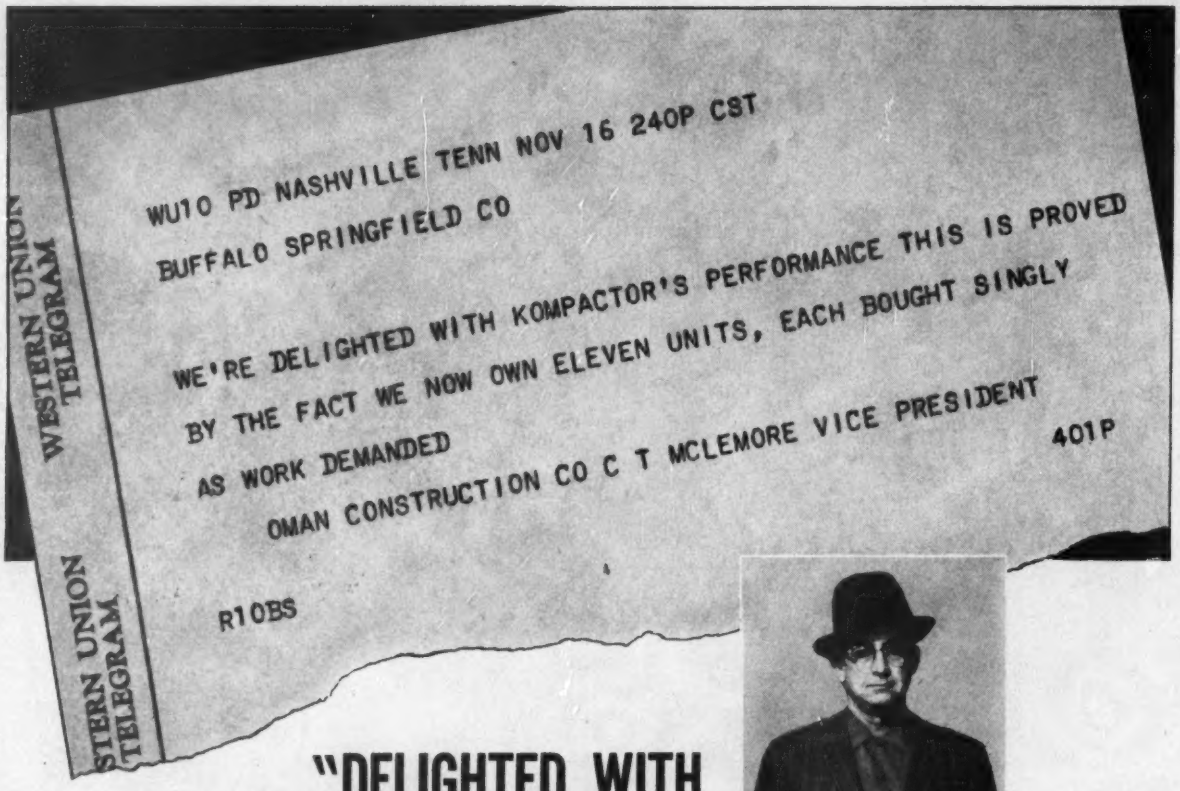
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WU10 PD NASHVILLE TENN NOV 16 240P CST
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WE'RE DELIGHTED WITH KOMPACTOR'S PERFORMANCE THIS IS PROVED
BY THE FACT WE NOW OWN ELEVEN UNITS, EACH BOUGHT SINGLY
AS WORK DEMANDED
OMAN CONSTRUCTION CO C T MCLEMORE VICE PRESIDENT
401P
R10BS
STERN UNION TELEGRAM

"DELIGHTED WITH KOMPACTOR® PERFORMANCE . . . *OWN ELEVEN*"

says C. T. McLEMORE, Vice President, Oman Construction Co.

Many cost-conscious contractors, like Oman Construction Co. have found Kompactor the practical answer to meeting density requirements. It's self-propelled, operates on an interrupted pressure principle that delivers the compaction you need in less time and with fewer passes. You get more uniform density. There's no displacement of materials due to "bulldozing" ahead of the wheels. And with Kompactor, you can wheel in tight to culverts, walls, and abutments — eliminate a lot of costly hand tamping work. Cost of compaction with Kompactor: About two cents per yard. See your distributor.

Road-to-Basement — *Oman Kompactors on highway job, and compacting fill in building basement show extreme versatility of machine. Each pad segment exerts pressure of 580 lbs. per lineal inch for total length of pad.*

BUFFALO-SPRINGFIELD COMPANY
Springfield, Ohio

A Division of **KOEHRING** *Company*

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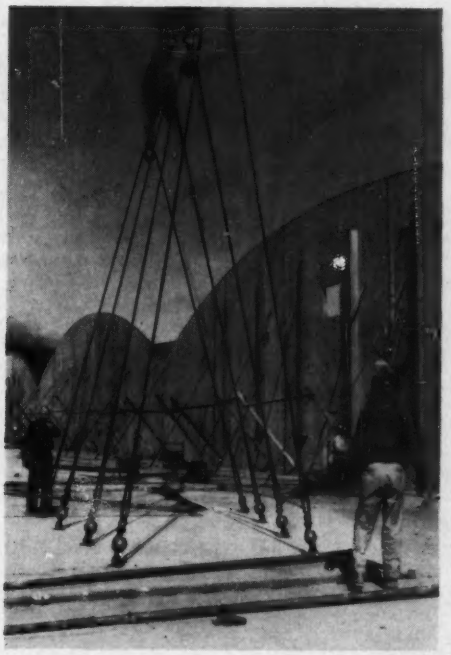
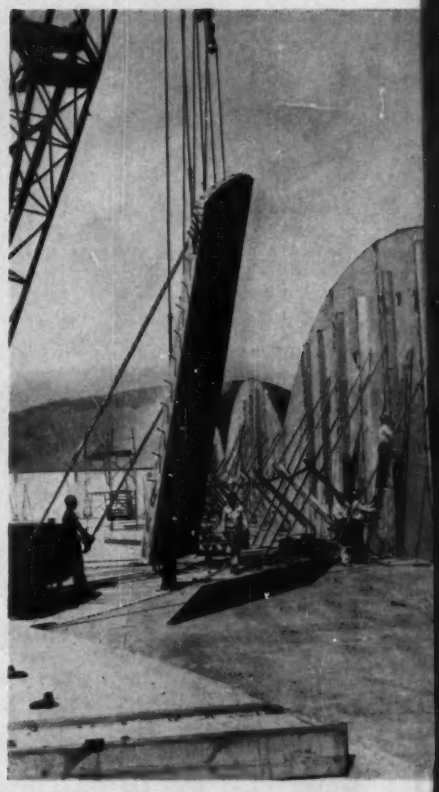


READY TO ERECT—An eight-man crew connects lift hardware for an eight-point pickup of panel. Four slings are suspended on pulleys from two small equalizing beams that hang from a larger beam. Inserts anchor lift hardware.



INTO PLACE IN A JIFFY—A 70-ton crane handles 25-ton panels with ease as it erects one every 10 min, thanks to fast handling by the crew. One crane and a 12-man crew placed 148 panels in 3½ days. Pipe struts anchored to inserts in concrete brace each panel.

Crane Erects Panels At Six-Per-Hr Pace

WITH ONLY ONE CRANE, a California contractor erected 148 precast wall panels weighing up to 25 tons each in just 3½ working days. On the best day, the contractor positioned 48 panels in one 8-hr shift.

That's an average of one panel in place every 10 min.

Associated Construction & Engineering Co. of South San Francisco is general contractor on the 400x800-ft factory-warehouse project that is now nearing completion just south of San Francisco.

Associated poured the 6-in.-thick wall panels on the floor slab of the building. Because there was ample room available, only a few panels were cast in double thicknesses.

The entire lifting crew consisted of 12 men, including a two-man crane crew and a two-man rigging crew supplied by the lifting subcontractor, Kelly Bros. of San Jose. Associated had eight men on the job to handle such chores as putting on and taking off the lift hardware and installing strongbacks and pipe supports.

The rig that handled the erection work was a 70-ton-capacity P&H truck crane. The extra capacity of the crane enabled the operator to swing the big panels with ease.

Panels were 19 ft wide and varied in height up to a maximum of 35 ft. The larger panels were lifted by means of an eight-point pickup arrangement. Two pairs of slings were rigged through a pair of small equalizing beams that were in turn supported by a larger equalizing beam. Some of the smaller panels were lifted by means of a four-point pickup.

Lifting hardware was screwed into 1¼-in. Richmond inserts that were cast into the panels.

Strongbacks were mounted on the larger panels to help them resist lifting stresses. The strongbacks were 2x10 timbers that were attached to the panels by six ⅝-in. bolts screwed into Phillips shells. The strongbacks were bolted to about half of the panels before the erection sequence began. Then workmen removed them from the erected panels and installed them on the remainder of the wall slabs. A trailer hauled by a pickup truck was used to move the strongbacks.

After the panels were in place they were braced with pipe supports. These were bolted to ⅝-in. Richmond inserts cast into the panels. The pipe braces were connected to the floor slab by ⅝-in. bolts that screwed into Phillips shells. Workmen drilled holes in the floor slab for the

CRANE ERECTS PANELS . . .

continued from page 87

SANDBLASTING — Workmen sandblast exterior of erected wall panels to expose the aggregate. Cast on the floor slab, panels were coated with a retardant to prevent hardening of the outer ½ in. of concrete. Sandblasting removed retardant, left attractively exposed aggregate finish.

Phillips shells before the wall slabs were cast.

A pair of small generators also came in handy during erection. These powered electric impact wrenches used for bolting operations and electric drills that sank the holes for the Phillips shells.

Immediately following the erection of the panels, workmen began casting poured-in-place columns. Associated has 20 sets of forms on the job and is pouring about 10 columns a day.

Work also has started on sand blasting the exterior of the panels to develop an exposed aggregate architectural finish. While the wall panels were being cast, they were coated with Controlset, a set retardant manufactured by Conrad Sovig Co. of San Francisco. This weakened the concrete matrix to a depth of about ½-in. and makes it easy to expose the surface aggregate by sand blasting.

For Associated, Robert McGinnis was project engineer and Dick Williamson was job superintendent.

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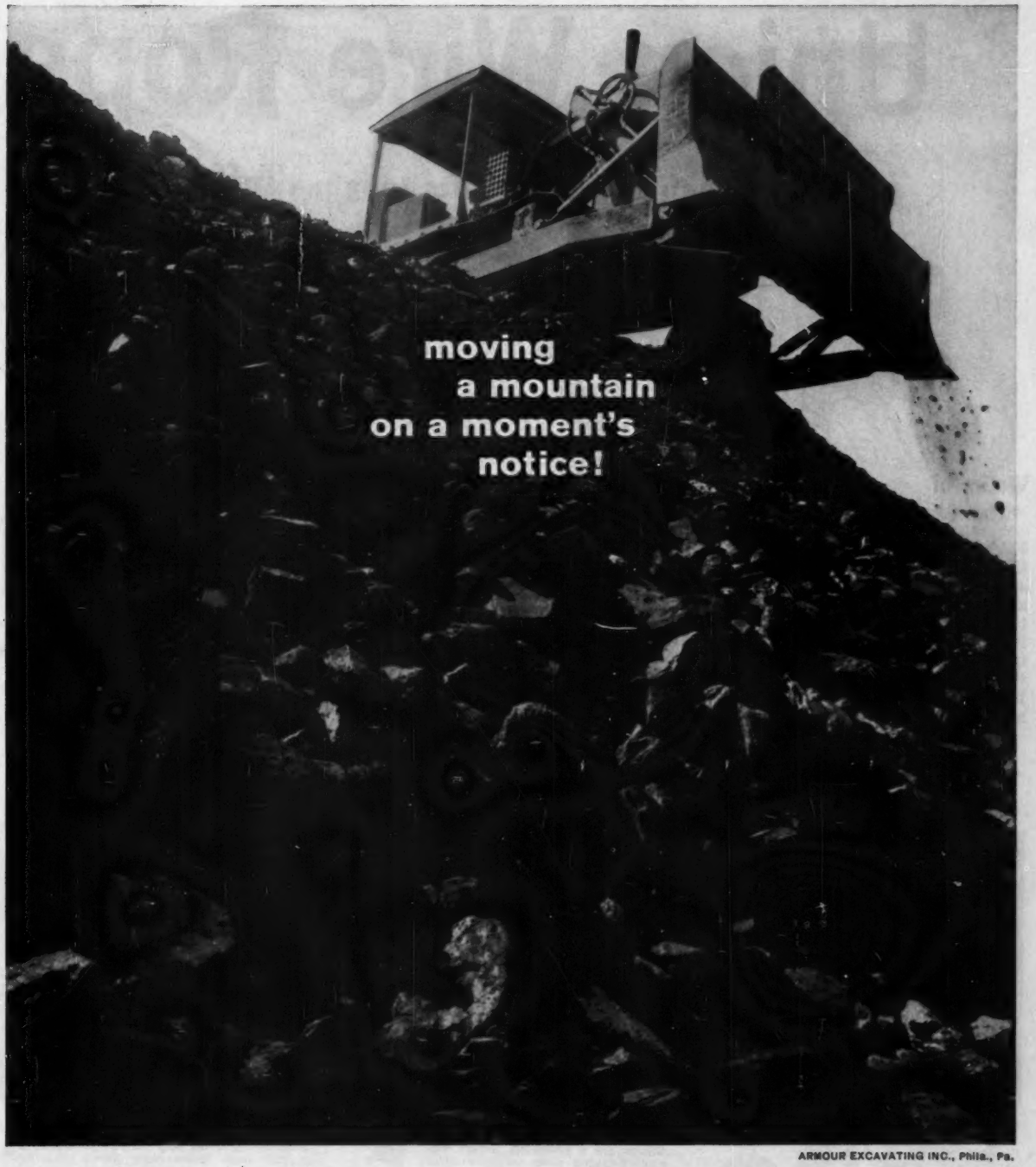


ARMOUR EXCAVATING INC., Phila., Pa.

Needless to say, moving a Brazilian mountain around the Philadelphia area is no easy task. A few minutes after a hurry-up phone call from a large steel company that had a change of plans, the Armour Excavating Company was on the job. It had been contracted to stockpile 30,000 tons of Brazilian iron ore in the Philadelphia area. The call came during the night and the job was finished by noon the next day. That's the kind of fast-trigger service provided by Armour. And, it's the kind of service Armour requires . . . and gets from Cities Service.

Protecting all of the Armour equipment are Cities Service products such as C-300 oil and Trojan H multi-purpose grease.

If you have to produce service "on a moment's notice," you deserve the same kind of service . . . and you get it from Cities Service . . . plus top quality products. Why not call your nearest Cities Service Office . . . or write Cities Service Oil Company, 60 Wall Street, New York 5, N. Y.

CITIES SERVICE

Out Front in Quality . . . Out Front in Service, too!

Circle 89 on Reader Service Card

Union Wire Rope

When the going gets tough-- Tuffy gets going,

Victim of the Bends

Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.

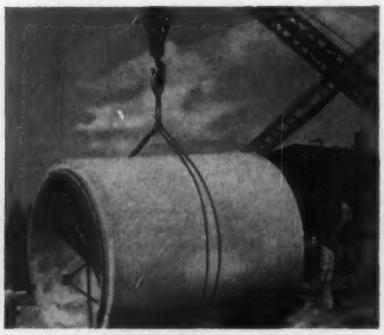
Kick Out Worn Sheaves

Old sheaves may never die, but in "fading away" they develop conditions which shorten rope life. Sheaves with grooves corrugated with rope lay impressions should be replaced with new ones before new wire rope is installed.

Union Tuffy's on these jobs give you the ultimate low cost.

Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact — that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.



Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.

Tuffy Dozer Rope

Mounts right on your dozer in a 150′ reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300′ and 500′ reels.

The Union Wire Rope Organization Gives You . . . RIGHT-NOW service with the RIGHT rope. Get set for quick action. Vast Union Wire Rope facilities assure fast delivery of just the wire rope or sling you need. More than 1600 standard constructions are available *plus* the famous Tuffy family of ropes and slings tailored to special needs. Hundreds of distributors and 15 strategically located warehouses help you meet emergencies—cut wasteful down-time. Call your Union distributor. He's listed in the phone book Yellow Pages.

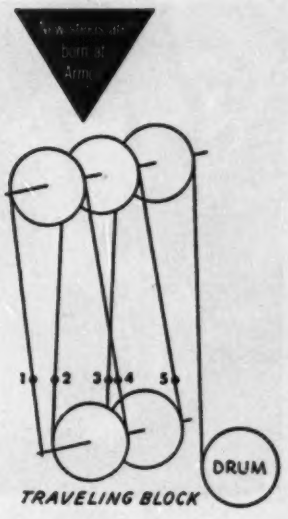
Tuffy Tips

and keeps going longer if not abused

Diameter of Rope	Min. Dia.	Max. Dia.
¼ - 5/16	+ 1/64"	+ 1/32"
5/16 - ¾	+ 1/32"	+ 1/16"
⅞ - 1⅛	+ 3/16"	+ 3/32"
1¼ - 1½	+ 1/16"	+ ⅛"
1⅝ - 2¼	+ 3/32"	+ 3/16"
2⅜ and larger	+ ⅛"	+ ¼"

Recommended groove sizes:

New ropes are usually over-size. It is advisable to have groove diameters of sheaves or drums as large as the actual calipered diameter of the new rope, or slightly larger. We recommend sizes as (above) charted.

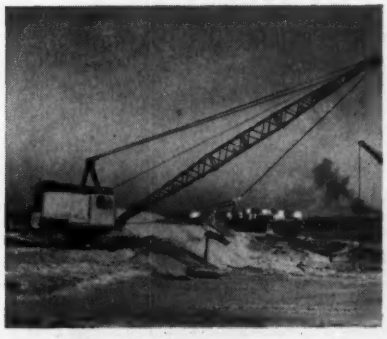


How to Figure Reeving Loads

Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

To count the number of parts supporting the load, draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

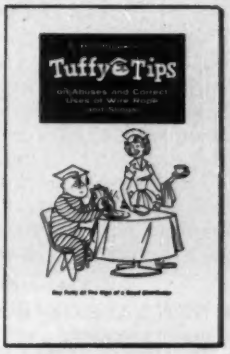


Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

Union's Handbook of TUFFY TIPS—Free!

The "Tuffy Tips" shown here are quoted right out of Union Wire Rope's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2270 Manchester Avenue, Kansas City 26, Missouri.



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ARMCO Union Wire Rope

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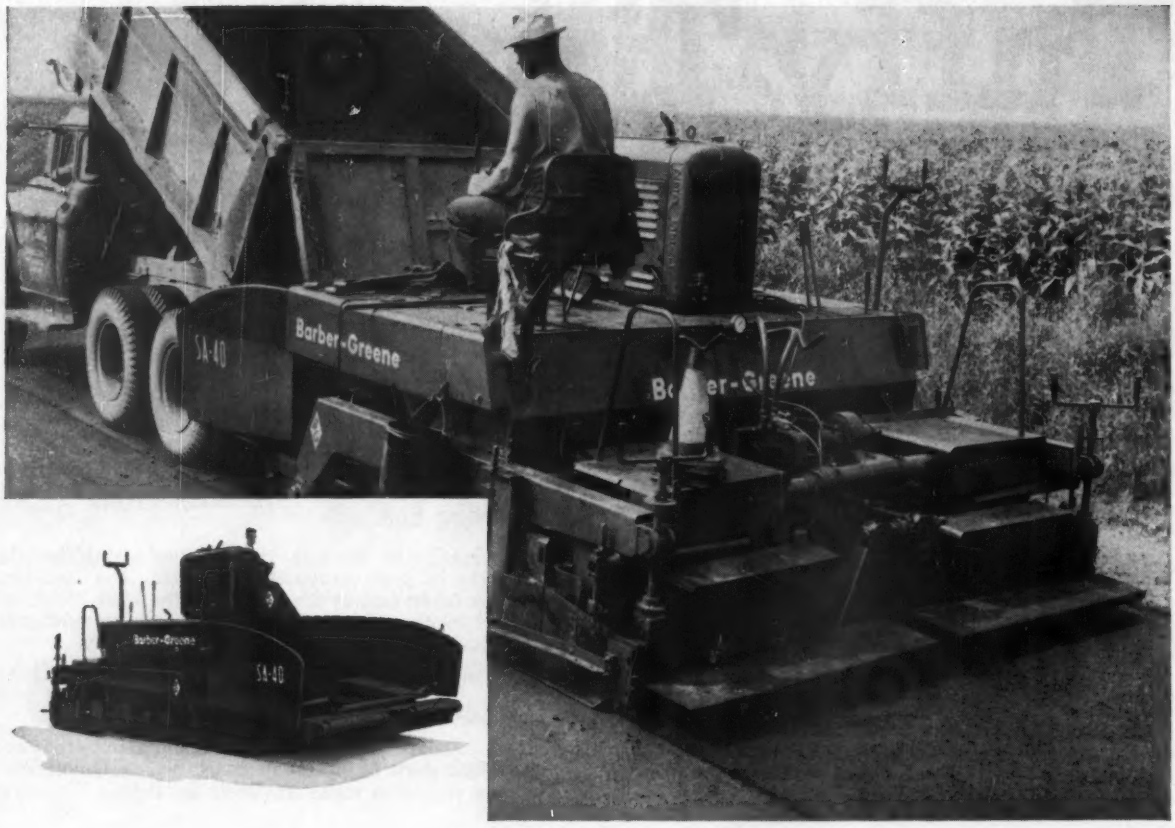

New Barber-Greene SA-40 Finisher

...newest advance in asphalt paving equipment

Barber-Greene's Model SA-40 is a new achievement in ease of operation and automatic features, combined with simple construction for greatest accessibility and ease of maintenance.

Its wide range of speeds from 12 fpm to over 4 mph with top speeds for both forward and reverse, together with its many other features assure greatest tonnage production at lowest cost.

OUTSTANDING FEATURES INCLUDE:

- **NEW EASE OF OPERATION** with joystick, power-assist steering.
- **HYDRAULICALLY SELF-DUMPING HOPPER.** Tunnel extends to rear of chassis for greatest capacity. Hopper gates controlled from screed platform.
- **HEAVY-DUTY LONGER LIFE SCREED** features hydraulic operation, high speed tamper that compacts before strike-off, improved automatic leveling, twin heaters.
- **AUTOMATIC FEEDER CONTROL** operates each pair of feeders and screws independently.
- **OSCILLATING PUSH ROLLERS** pick up trucks on-the-fly regardless of alignment.
- **SIMPLIFIED SERVICING** achieved through unitized construction and simple, efficient, accessible power train.

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Circle 92 on Reader Service Card

The Case For Crawler-Drawn Scrapers

Haul distances are only one of the factors that influence scraper production. On some jobs, soft or rutted haul roads and sustained adverse grades take away a wheel tractor-scraper's biggest asset—speed. Under these conditions, crawler-drawn pans often move dirt more cheaply. Here's how to pick the right type of scraper.

WHAT'S THE MOST IMPORTANT job factor in deciding between wheel tractor-scrapers and crawler-drawn scrapers?

Ask a contractor this question and he'll fire back the reply: "Haul length." And he will be right—but only partly so.

In certain cases, two other factors can be as important as haul length: rolling resistance of the haul road, and the road's adverse grade. A contractor who fails to consider these along with haul distance may throw money away by using wheel tractor-scrapers when crawler-drawn units can do the job more cheaply.

Rolling resistance is the force that must be overcome to move a wheel. Tests show that to move a machine along even the best surface, a 40-lb pull must be exerted on a wheel for each ton of gross weight. For every inch the wheel sinks into the ground, 30 lb more force per ton is required.

When a wheel tractor-scraper penetrates deep into a haul road, it needs all its power to battle the added resistance. In loose sand or gravel, rolling resistance often can be reduced by shaping the road with a grader and wetting it down with a water truck. But on smaller jobs this extra expense may not be worth while. Using a crawler-scraper is sometimes better because the machine's haul time varies little as road conditions change.

Below are various road surfaces and their rolling resistances:

HAUL ROAD CONDITION	RESISTANCE IN LB/TON GROSS WEIGHT
Hard, maintained surface	40
Packed snow	50
Light surfacing or firm dirt, occasional water and maintenance	65
Loose snow	90
Dirt flexing under load, little water or maintenance	100
Rutted soft dirt, no water or maintenance	150
Loose sand or gravel	200
Mud, rutted, no maintenance	300-400

Adverse road grade is slope rising to the unloading site. Sustained adverse grade isn't found often. But when it is, it influences production sharply. Crawler-scrapers are often the better machines here because tough grades slow down wheel units.

Up a 3% sustained grade, for example, a crawler unit moves dirt more cheaply than a wheel unit, unless the rolling resistance is less than 120 lb per ton. As the table shows, this means a reasonably firm surface.

On a 6% sustained adverse grade, crawler-scrapers are better except when the road has less than 90-lb-per-ton resistance. A crawler unit working up a 9% grade moves dirt more economically no matter what the road surface or haul distance.

continued on next page

Conversely, grade sloping down to the unloading site favors use of wheel tractor-scrapers. The speed they attain going downhill offsets time lost climbing slopes while empty.

To find more precisely the effects of haul length, rolling resistance and adverse grade on both types of scrapers, Caterpillar Tractor Co. compiled several zone graphs. These show clearly which type of unit moves dirt most cheaply under varying conditions.

Three types of scrapers are compared—two crawler-drawn and one wheeled. Basis for comparison is cost per yard of material moved.

To find cost figures, Cat applied a standard method of estimating owning and operating costs. It was modified by giving the crawler tow tractors lower repair costs and a 10% longer life than usual —because towing wears a unit less than dozing or pushloading. Life of scrapers was set at 16,000 hr or 8 yr. Cost per hour was found by dividing yards moved by over-all operating cost per hour.

Here are estimated hourly owning and operating costs for the three types of rigs, including wages of $3 per hr:

1. 235-hp crawler tractor towing a 19-yd scraper — $13.31
2. 235-hp crawler tractor towing a 28-yd scraper — 14.12
3. 280-hp, 18-yd wheel tractor-scraper pushloaded by 235-hp crawler tractor — 14.06

FIG. 1 contains pay load and cycle figures used for the comparisons, plus the total cost of operating three units of each type of scraper. Cat drew on many job studies and report summaries to develop these operating figures. Weight of material moved was 3,000 lb per yd. Travel speed was based on rated rim pull or drawbar lb-pull.

FIGURE 1.

Haulers	Pusher	Pay Load (BCY)	Load Time in Min	Turn & Dump in Min	Eff Hr in Min	Total Cost 1 Hr
19-yd crawler-scrapers	none	15	1.00	0.93	50	$39.93
28-yd crawler-scrapers	none	19	1.50	0.96	50	42.36
18-yd wheel-scrapers	235-hp crawler	13.7	0.70	0.50	45	58.73*

***Found by multiplying scraper hourly cost by three and adding hourly cost of the 235-hp pusher.**

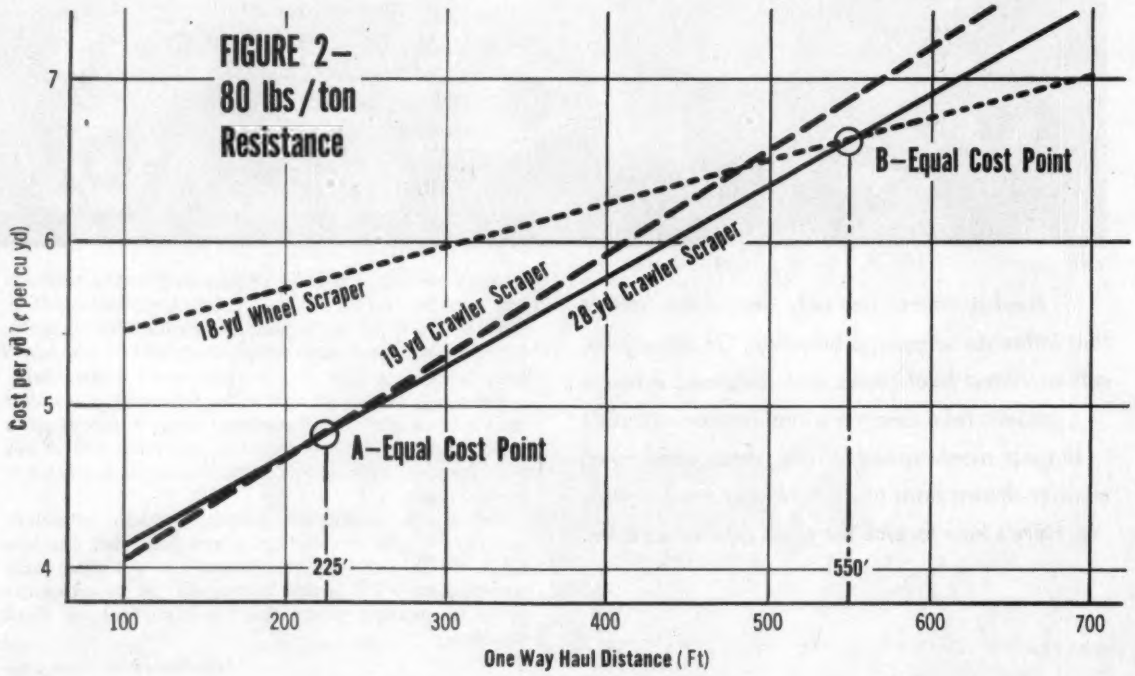
FIG. 2 shows a comparison of the three types of rigs working on a level road of 80 lb per ton rolling resistance. Cost per yard is plotted against one way haul distance.

Note that at point **A**, 225 ft, cost per yard for the 19-yd crawler-scraper is the same as for the 28-yd crawler unit. At point **B**, 550 ft, cost per yard for the 28-yd crawler is the same as for the 18-yd wheel-scraper.

These two equal-cost points indicate distances at which one rig becomes cheaper to use than the other. But this one graph gives a comparison for only one resistance: 80 lb per ton.

Cat next plotted graphs similar to Fig 2 for level haul roads of 40 to 400 lb per ton rolling resistance. All the equal-cost points were put on a graph and joined into two curves. The result is Fig. 3. The curves divide the graph into three zones.

continued on page 96



Working side by side, but exactly ten years apart in age these mixer units point up Campbell's long reliance on Macks.

On location in metropolitan Baltimore this mixer unit supplies concrete for a repaving project.

Campbell's 105 Macks help satisfy Baltimore's big appetite for concrete and aggregates

Ready-mix concrete and aggregates have to move in volume at Harry T. Campbell Sons' Corporation, Towson, Md. . . . and with the help of Macks they do. The 105 business-like Mack mixer trucks, tractors, and dump trucks bearing the Campbell name that work throughout the Baltimore area are more than a sign of up-to-date, well-maintained equipment. Wherever you see one of these Macks you can be sure its owner is not only saving money on hauling costs, but getting an extra bonus of long, trouble-free vehicle life.

Says Ross Hoffman, fleet superintendent, "If there's one thing you learn fast in this business, it's the value of working with the most durable trucks you can buy. If you don't, downtime and maintenance costs can ruin your profit picture. We use Macks because handling concrete on tough construction sites softens up ordinary trucks too fast."

Statements like this point up one of the principal reasons for the acceptance of Mack trucks—*their amazing durability* . . . not just when new but long after other trucks have "softened up" to the point where they are unprofitable. A Mack is more durable because it is a true quality vehicle. Quality built by Mack from the ground up . . . not just assembled with "off the shelf" parts from a number of different manufacturers. Mack manufactures its own engines, carriers, transmissions, axles, gears, and all other major components . . . to the highest standards of the industry. And every component made by Mack is for Mack trucks alone. Those who say that craftsmanship is dead just aren't familiar with Mack trucks.

It goes without saying that the quality Mack builds into every truck can make a profitable difference in your own operating costs. Mack trucks will help you maintain dependable performance and keep maintenance costs down . . . eliminate downtime problems before they start and give you the truck service you need for a better operating picture.

The Mack branch or distributor nearest you has complete details on the Mack model best suited to your requirements. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

MACK
FIRST NAME FOR
TRUCKS

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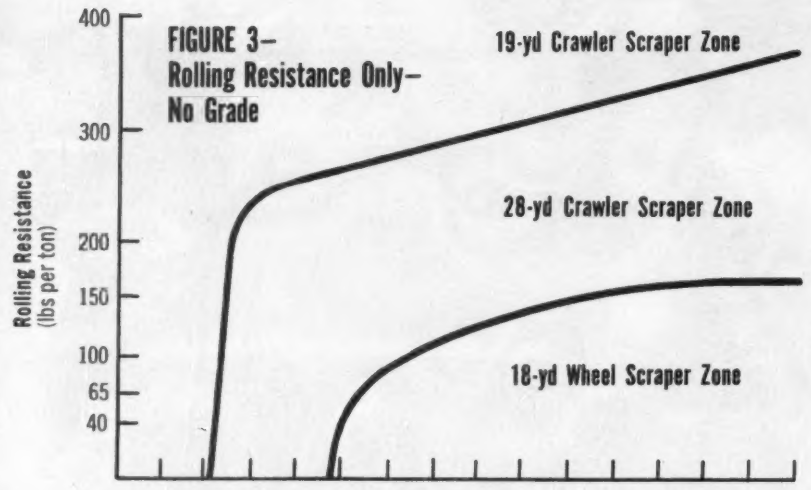
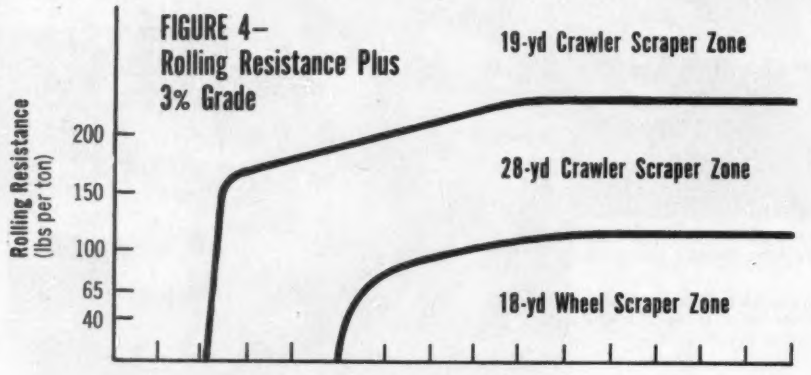
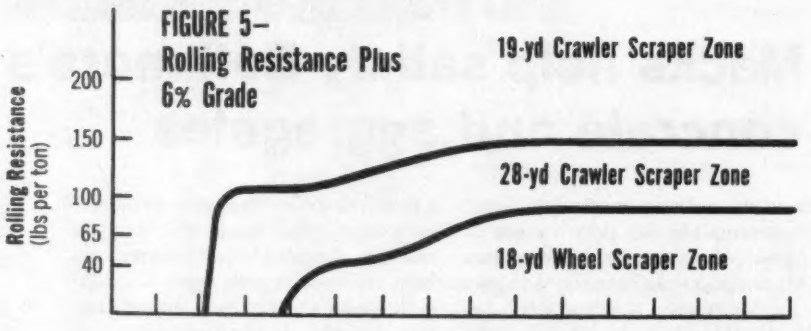
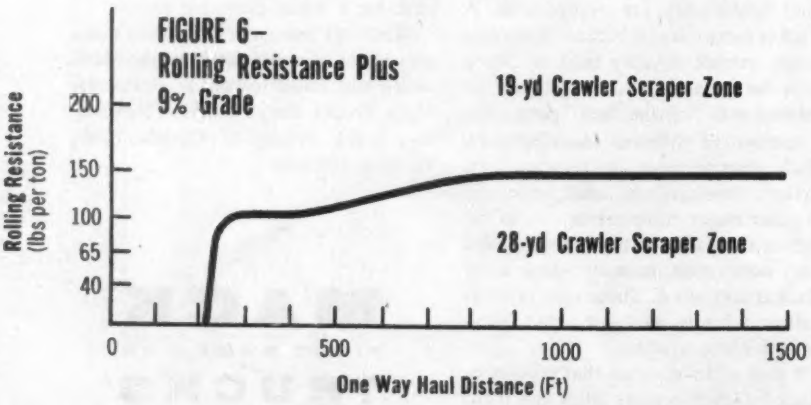








THE CASE FOR CRAWLER-DRAWN SCRAPERS . . .

continued

FIG. 3 reveals that up to about 200 ft, hauls can be handled most cheaply by the 19-yd crawler-scraper, regardless of rolling resistance. From 200 to 475 ft, the 28-yd crawler-drawn rig is best for most types of road. For longer hauls, choice of equipment depends more on rolling resistance than haul length.

Fig. 4, 5, and 6 show how sustained adverse grades of 3, 6, and 9% influence the three scraper zones. As haul roads become steeper, crawler-scrapers become the more economical type of machine. The advantage of wheeled rigs falls off quickly, even on good roads.

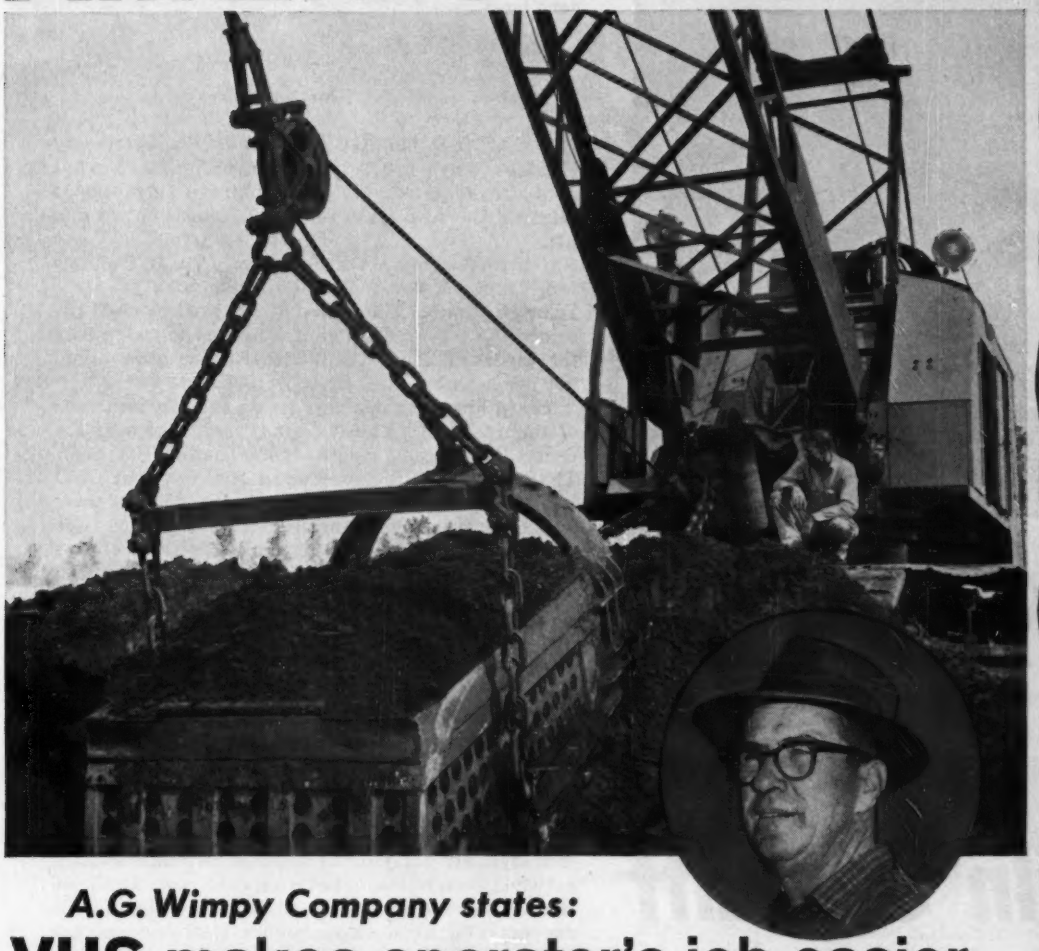
IN FIG. 4, zones are similar in shape to those in Fig. 3 but the crawler-drawn units have become best for a greater span of resistances. For example, in Fig. 3, the wheeled unit is most economical for 1,000 ft hauls along level roads of less than 150 ft per ton resistance. But on the 3% upgrade of Fig. 4, wheel scrapers shouldn't be put to work unless the haul road resistance is less than about 110 lb per ton.

IN FIG. 5, the 6% grade compresses the curves down sharply, squeezing the wheeled scraper zone below 95 lb per ton rolling resistance. Finally, **FIG. 6** indicates crawler-scrapers are the only rigs for 9% grade.

Other factors besides haul road characteristics may make crawler-drawn scrapers the wise choice. They are less expensive to buy and operate. They last longer than wheeled rigs and are much more versatile. A small contractor can get double use by unhitching the tractor from the pan and putting it to work dozing, pushloading, clearing, or ripping. Crawler units also can operate in wet weather and may work 30 more days per year.

In short, haul road length is highly important. But by ignoring other factors the contractor may be detoured from the cheaper method. Condition and grade of the road, and many other considerations, must be weighed separately.

AMERICAN CABLE



A.G. Wimpy Company states:

VHS makes operator's job easier

HOLMES BEACH, FLORIDA—R. H. Massey, Wimpy Company Superintendent says, "The biggest difference we can see between VHS and other cables is the way it holds up on the job. Take our Northwest 95. We know that the VHS line on that machine is good for five weeks' work. This makes the operator's job easier for he can go "full tilt" all this time without fear the rope will break in the middle of the job. This is two weeks more service than any other rope has produced. And of course, the amount of time the machine is down for rope replacement is cut, too."

What is VHS? What will it do for you?

- It's the first new grade of rope ever developed for Very High Strength applications.
- It's 15% stronger than Improved Plow Steel.
- It's tougher, more resistant to wear.
- It stands up better on scrapers, dozers, shovels and draglines—the rough work.
- It cuts the number of rope replacements on scrapers, dozers, shovels and draglines.

Immediate delivery of VHS—in short lengths or full reels—is available now from your nearby American Cable distributor. Don't settle for substitutes. Insist on VHS—the rope with the double green strand.

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Please send me **FREE** American Cable Wire Rope Recommendation Booklet listing right diameter, construction, lay and grade of wire rope for over 50 general contracting jobs.

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Circle 97 on Reader Service Card

DEEP CUT—As crawler-mounted drill sinks 6-in. holes for next shot, a 2½-yd shovel loads rear-dump trucks. Haul to fill is ½ mi.

80-Ft Rock Cut Blasted In One Lift

By WILLIAM G. MOONEY, Assistant Editor

"IT CAN BE DANGEROUS, but it's extremely effective when properly controlled." That's what rock superintendent Dick Boudreau says about blasting the full depth of an 80-ft rock cut in one lift.

Contractor Oneglia & Gervasini, Inc., of Torrington, Conn., is doing just that on a road job near Winsted, Conn. The $1.5-million project calls for relocating a 2-mi stretch of Route 44 to make way for the Mad River Dam. Excavation totals about 900,000 yd, and 85% of it is rock.

There are several rock cuts on the job, and each of them is deep. The largest cut, located near the center of the job, ranges from 50 to 80 ft deep. That's a big lift to take out in one shot, but O&G is high on the method and results so far bear them out. Both production and fragmentation have been good, and there has been no trouble from sliding muck piles.

"Basic advantage of the system is that we save several setups per shot," explains Boudreau. "Our drills sink 6-in. holes in one lift. They don't have to move back in later for a second lift. And it's economical from the viewpoint of powder use. We've been using less than 1 lb per yd pulled, mostly because hole patterns can be opened up to about 18 ft when depth reaches 50 ft. We start with a 16x18-ft pattern.

"As for the danger of slides, we avoid that by keeping the muck pile spread out. The secret here is delays. By delaying as much as two milliseconds between each hole and between each row, we throw the bulk of the shot well out from the face. In the deeper cuts, we deck each shot to throw out the bottom first. The muck pile is not high enough to seriously endanger shovels and other equipment in the cut. Of course, the shovel operators are careful not to undermine the pile and create a slide as they work towards the face."

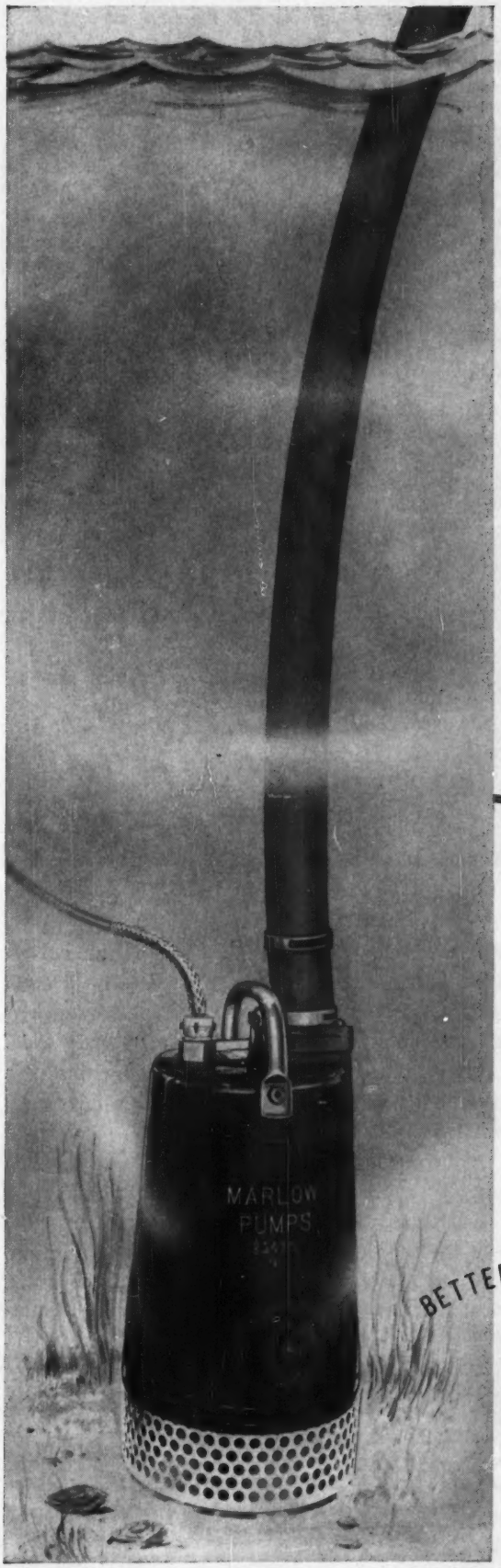
Oneglia & Gervasini subbed the drilling to C&G Drilling Co. of North Branford, Conn. C&G drills three rows of 6-in. holes per shot. Each row contains seven holes. A Bucyrus-Erie 30-R crawler-mounted rig with a fixed mast drills the five vertical holes at the center. A special rig with a tilting mast drills the slope holes at each side.

For the deeper lifts, C&G also drills vertical relief holes at the gutter lines. These average only 18 ft in depth. A 900-cfm Chicago Pneumatic and a 600-cfm Ingersoll-Rand compressor supply air to the drills.

The slope hole drill is manufactured by the Gill Drilling Equipment Co., an affiliate of C&G. It consists of an Ingersoll-Rand 325A drill mounted on a Gar Wood crawler assembly. A GMC Series 353 engine powers the rig. Its hydraulic system is by Commercial Shearing & Stamping Co.

Both drills use Gill, I-R, and Atlas Copco carbide-tipped bits. Bit diameter varies from 6½ in. at the top of the hole to 5¾ in. at the bottom. Drill steel consists of 4-in.-OD steel pipe fabricated

TILTED MAST—Gill slope-hole drill consists of down-the-hole drill with tilting mast mounted on crawlers. Normal pattern is three rows of seven 6-in. holes per shot. Bucyrus-Erie 30-R (top photo) sinks five holes in row and Gill rig sinks outside holes.



THE *NEW* MARLOW ECON-O-MERSE III

. . .The most advanced design in submersible pumps

For those tough de-watering projects where only a submersible pump can do the job, Marlow now offers a new, field tested, diffuser type submersible . . . the Econ-O-Merse III.

The Econ-O-Merse III is a ruggedly built 3" submersible featuring cast-iron intake, aluminum casing and corrosion-erosion resistant impeller and diffuser. Stainless steel hardware and two Remite® seals further complement this pump for heavy construction duty.

Streamlined in appearance, the Econ-O-Merse III is designed and built with fewer parts to simplify field servicing. This new Marlow engineering achievement has the capacity to handle any pumping job with speed, ease and efficiency.

Write today for complete specifications on the newest addition to the Marlow construction pump line—Econ-O-Merse III.

BETTER PUMPS THROUGH CREATIVE ENGINEERING!

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Steel for strength, economy, durability

Despite winter weather, this Armco MULTI-PLATE Pipe culvert was quickly assembled by bolting together corrugated metal plates.

Armco Pipe Installed 9 days after order

It was an emergency—an old stone arch culvert failed under a road at Rocky River, Ohio. To reopen the road, the culvert had to be replaced quickly! So they ordered an Armco MULTI-PLATE® Pipe.

Just 9 days after placing the order for this 132-inch diameter, 84-foot long structure—it was assembled in place, ready for backfilling!

Armco will always make an effort to give the type of service you desire and your local Armco Sales Engineer will do everything he can to expedite delivery for your project. For dimensional information and delivery data, call him. **Armco Drainage & Metal Products, Inc., subsidiary of Armco Steel Corporation, 7931 Curtis Street, Middletown, Ohio.**

ARMCO **Drainage & Metal Products**

Circle 100 on Reader Service Card

by Gill in 10-ft changes with 3½-in. API regular rotary joints.

O&G blasts in the big cut about every 2½ days. Each shot pulls about 14,000 yd. Boudreau's crew loads the holes with 6 to 8 tons of ammonium nitrate and semi-gel dynamite. They place 75 lb of 75% primer at the bottom of each hole, packing it in with 90 lb of Aquatol. Column load atop the primer is Amacore D or Gianite. All explosives are supplied by Atlas Chemical Industries, Inc.

The contractor is loading out of two rock cuts at a time, working two shifts per day. In each cut, a Northwest 80D shovel with 2½-yd bucket is loading a fleet of Euclid and Cat-Athey rear-dumps. Each shovel averages about 150 yd per hr. Average haul distance is ½ mi.

Dozers spread the rock fill in 3-ft layers. Because breakage is good, voids in the fill are practically nonexistent. Trucks and dozers provide what compaction is needed. There is not enough earth on the job to place binder layers between the rock, but, fortunately, this is not necessary to obtain a tight fill. Maximum size of rock is that which can be handled by a 2½-yd bucket, so there is little secondary blasting.

Francis Oneglia is project manager for the prime contractor. Leon Short is superintendent. Howard Church is project manager for C&G Drilling Co. Paul Crete is drilling foreman. Resident engineer for the Connecticut State Highway Dept. is Tom Dwyer. F. W. Disdrow is district engineer.

ECONOMICAL—Bucyrus-Erie 30-R sinks holes to full depth and rock comes out in one lift. Powder factor is only 1 lb per yd pulled.

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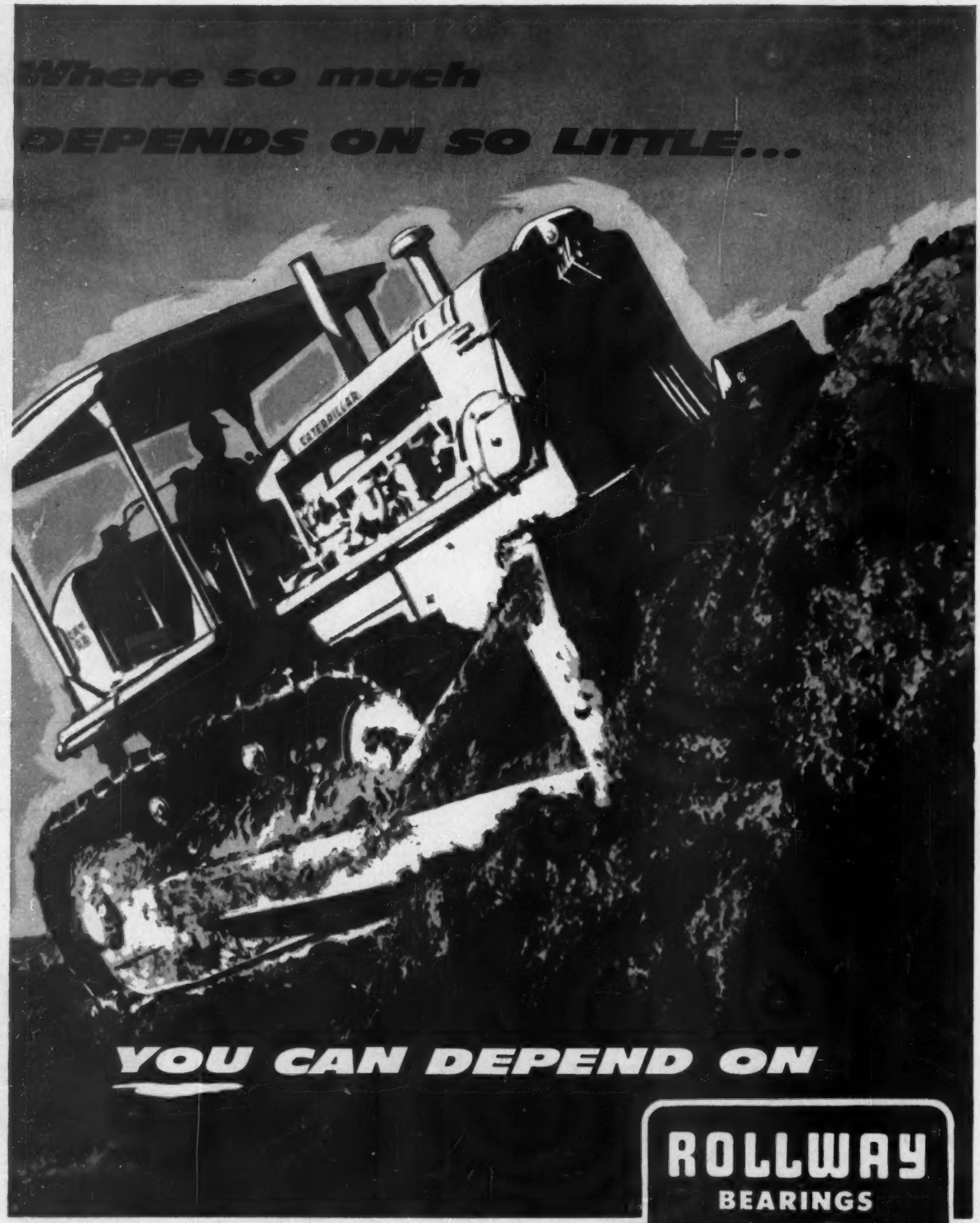

The rugged Caterpillar crawler Tractor above is depended upon throughout the world to keep the big jobs moving. A single bearing failure can cause costly delays, perhaps endanger job completion in contract time. That's why Caterpillar and other well-known makers depend on Rollway bearings in vital spots! Rollway Bearing Company, Inc., Syracuse, N. Y., manufacturers of a complete line of radial and thrust cylindrical roller bearings. Write for a complete product line catalog.

ENGINEERING OFFICES:
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Circle 102 *on Reader Service Card*

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Silent Hoist & Crane Co.: M-W Equipment Co. will handle Krane Kar and Liftruk sales in seven counties in New Jersey, seven in Pennsylvania, and one county in Delaware.

Worthington Corp.: Barouco Equipment, Inc., has been appointed distributor for the Baton Rouge, La., area.

Ellicott Machine Corp.: Harron, Rickard & McCone Co., Norwalk, Calif., is new distributor for Southern California.

Scheid: The West German firm's vibratory tandem rollers will be distributed in this country by Asphalt Equipment Co., Fort Wayne, Ind.

Aluminum Co. of America: Alcoa tube and pipe will be handled by Chas. F. Guyon, Inc., New York.

Koehring Co.: Furlow-Laughlin Equipment, Inc., Baton Rouge, La., has been named southern Louisiana distributor for Koehring, Parsons, C. S. Johnson, Buffalo-Springfield, and Ka-Mo construction equipment.

Oliver Corp.: P. M. Burns Farm and Industrial Supply has been appointed distributor in the Clearfield, Pa., area.

Continental Machinery Corp.: Yanmar diesel engines will be handled in Texas and Louisiana by Stewart and Stevenson Services, Inc., Houston.

Barber-Greene Co.: Mitchell Distributing Co., Charlotte, N.C., is distributor for the state.

Seaman Corp.: Square Deal Machinery and Supply Co., Inc. has been appointed distributor for eastern Florida.

continued on page 104

OWNERS REPORT

On Ellicott Dragon® Model Portable Dredges

California Irrigation District Manager

O. E. Simmons, Palo Verde Irrigation Dist., Blythe, Cal., says, "All checks indicate the dredge is exceeding the specified capacity. Our operators frequently comment on the simplicity of operation and the small amount of effort required to handle the control system."

Georgia Dredging Company Official

James G. Hardee, III, Chatham Dredging Co., Savannah, Ga., reports, "We are well pleased with the operation of our DRAGON's all-hydraulic system. It is excellent. It has insured very economical ease of operation."

Ohio Municipal Water Department Director

W. T. Eiffert, Dayton, Ohio, writes, "We have never received such a complete piece of equipment, nor have we ever received such complete training in the operation of a new piece of equipment."

Florida Real Estate Developer

Leonard Mulbry, "Venezia," New Smyrna Beach, Fla., states, "We have been more than satisfied with the production and operation of our Ellicott DRAGON. It is well engineered, accurately constructed and economical to operate. We have determined the value of obtaining a completely engineered dredging unit from a reputable manufacturer rather than building one ourselves or obtaining one from a less well-established firm."

Other satisfied users of Ellicott DRAGONS have made similar statements, all of which testify to the DRAGONS' top-flight design, quality Ellicott components and proved performance. When you are considering the purchase of a dredge to excavate underwater earth materials, we will be glad to furnish the technical details on the correct DRAGON for your project.

A comprehensive brochure describing the complete line of standardized DRAGON model dredges and their wide variety of applications has been prepared for you. Simply fill in the handy coupon and your copy of Bulletin 980 will be mailed promptly.

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Ellicott-Brandt, Inc., Baltimore, Maryland; McConway & Torley Corp., Pittsburgh, Pennsylvania; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico.
Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

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1605 Bush Street • Baltimore 30, Maryland
Send me a copy of Bulletin 980, describing the complete line of DRAGON model dredges.
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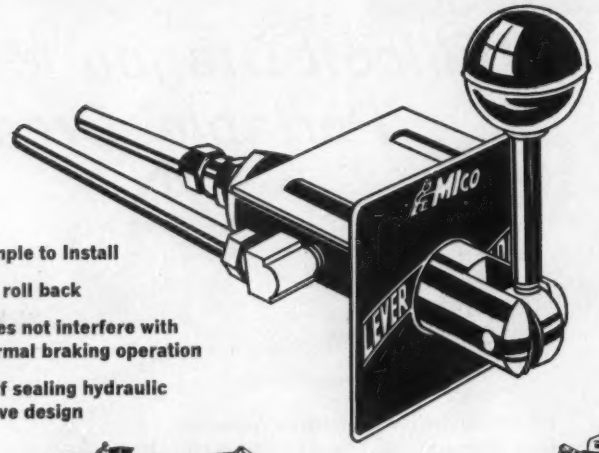
MICO HYDRAULIC PARKING LEVER LOCK



- Simple to Install
- No roll back
- Does not interfere with normal braking operation
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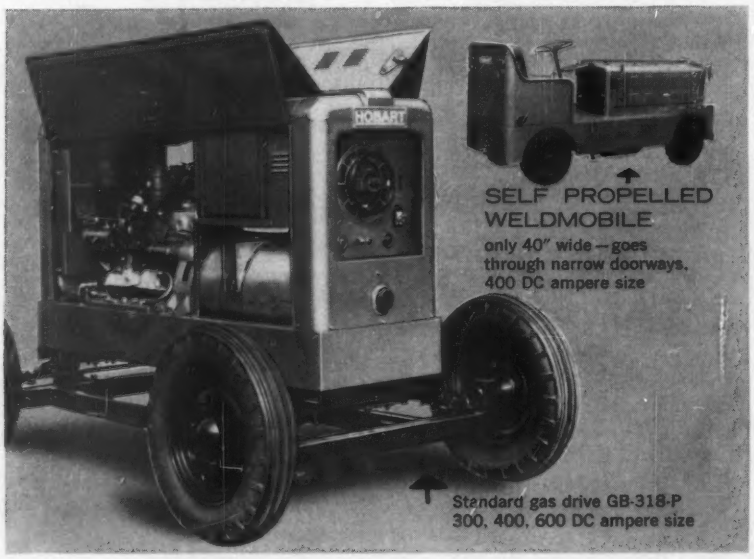
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Standard gas drive GB-318-P 300, 400, 600 DC ampere size

WELD ANYWHERE/FAST/AT LOW COST

These Hobart DC gas drive models can cut your maintenance and construction welding costs. Here's why: Exclusive Multi-Range Dual Controls provide 1,000 current settings. Remote Control permits fine current adjustments at the work. Self starting engines. DC outlets for auxiliary power. Idling device saves gas. Weldmobile eliminates labor tieups—one man drives, welds.

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"Manufacturers of the world's most complete line of arc welding equipment"

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SALES AND SERVICE . . .

continued

Cummins Engine Co.: Thomas D. Taylor heads Cummins Oregon Diesel, Inc., a new distributorship for Oregon and southwest Washington.

Koehring Co.: The Kwik Mix Co. has named Carroll & Edwards Co., Cincinnati, Ohio, distributor for southeastern Ohio and three bordering Kentucky counties.

On The Sales Front

Hercules Powder Co.: William D. Cashin has been named manager of construction sales nationally, with headquarters in Wilmington, Del.

Hico Corp. of Ameria: Robert E. Wilson is new sales manager of the Aluminum Div. He handles sale and lease of the Alcoa-Hico beam.

U. S. Steel Corp.: Donald A. Fitch has been named manager of pipe line sales for National Tube Div.

Raybestos-Manhattan, Inc.: John McKinlay is new assistant manager of the eastern sales region.

Ply-O-Glas Co.: Joseph E. Como is new sales manager, with headquarters at Great Neck, L.I., N.Y.

Erie Strayer Co.: Kenneth Simpson has been appointed western regional sales and service engineer, with headquarters in San Francisco.

American Hoist & Derrick Co.: Richard E. McCoach has been appointed manager of industrial sales.

Special Mention

Construction Equipment Exposition: An exhibitor's space brochure is available for the Construction Equipment Exposition and Road Show, to be held in Chicago's Amphitheatre, February 23 to March 1, 1963. Copies can be obtained from the Construction Industry Manufacturers Association, 135 South LaSalle St., Chicago 3.

J .W. Peters & Sons: The Burlington, Wis., firm will manufacture prestressed concrete products, utilizing the Leap system of standardized products.

Circle 105 on Reader Service Card ➤

Better Balanced Euclid C-6 gets more work done!

Owners of the "Euc" C-6 report that it's the best balanced tractor in the 200 h.p. class. Low center of gravity and close mounting of blades made possible by a rear-mounted radiator eliminate "nosing down" in heavy dozing work. The C-6 works easily on slopes where other crawlers can't be used because they won't hold on . . . and lower ground pressures let the "Euc" work in soft going that stops competitive tractors.

You've really got to see a C-6 at work to know what its excellent balance means in performance and productive capacity . . . your Euclid dealer will make arrangements, so get in touch with him soon.

C-6 *. . . lowest cost crawler in the 200 h.p. class . . . and most versatile by far!*

GM GENERAL MOTORS EUCLID

EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

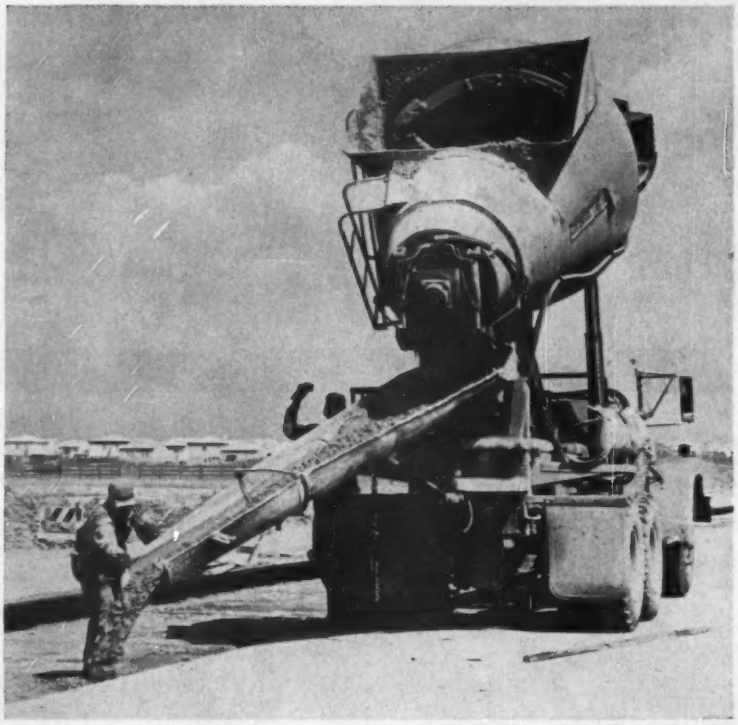
Construction Equipment News

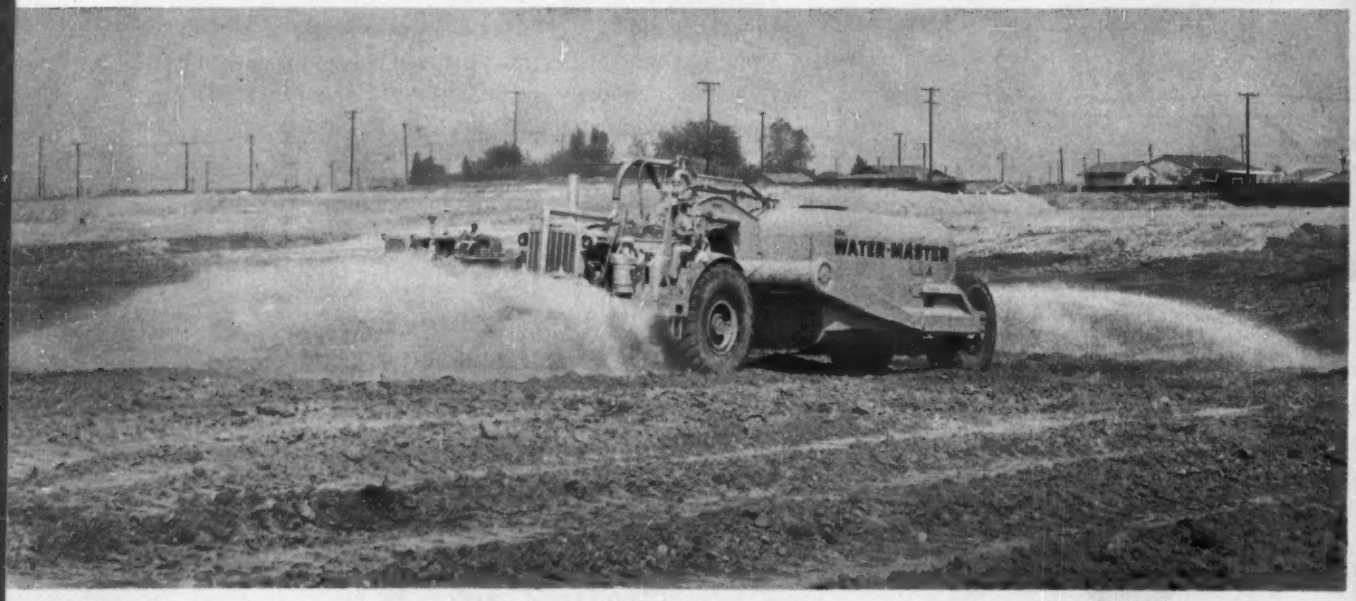
For more information on any item, circle the key number, found at the end of each item, on the READER SERVICE CARD just inside the back cover.

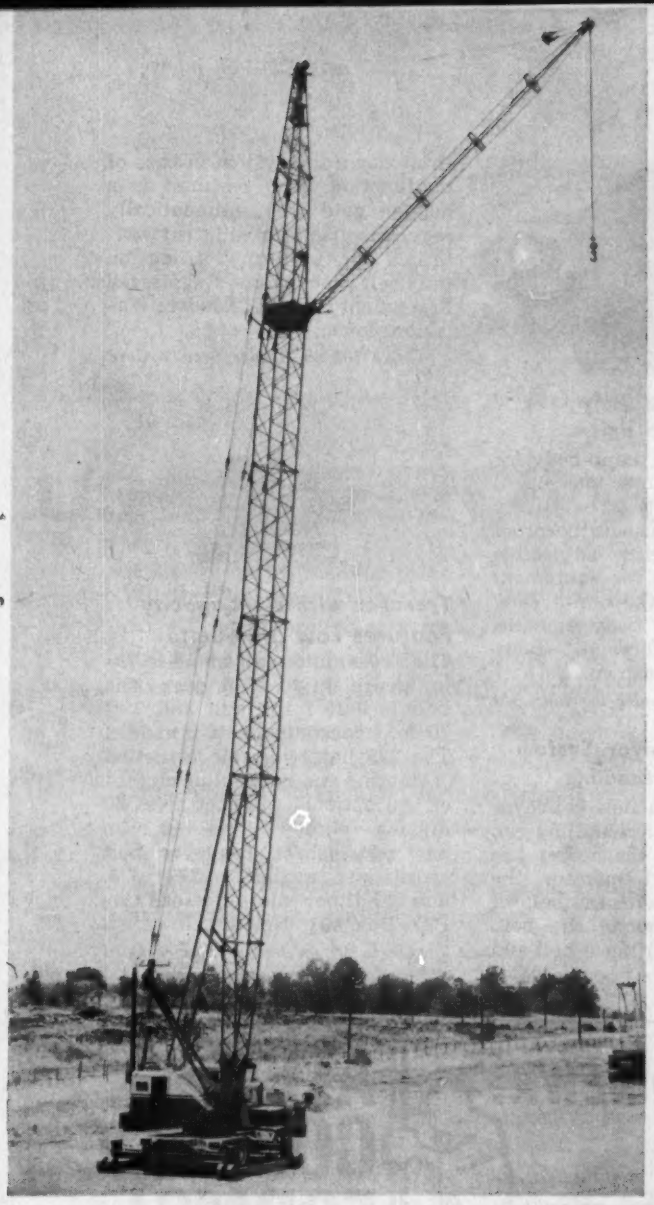
Rapid Discharge For Concrete Carrier

A hydraulic tilting mechanism, spiral discharge blades, and over-sized discharge gate and chute combine to enable the Road-Runner to discharge a 7-yd load in 27 seconds. The hydraulically-powered unit has inching controls on the discharge gate allowing the operator to control the flow of concrete. Hydraulic chute lifters aid placement. Steel spiral blades with rubber wiper extensions provide constant agitation for the load, and permit the addition of water at any time during operating cycle. The Road-Runner is adaptable to either front or flywheel power takeoff trucks. — T. L. Smith Co., Milwaukee, Wis.

Circle **301** *on Reader Service Card*







Truck Crane Becomes Tower Crane

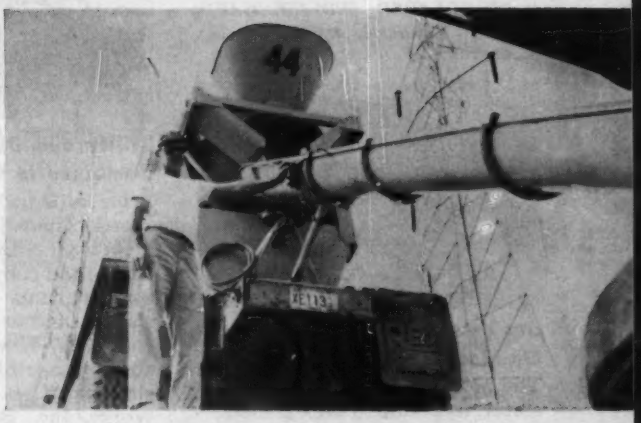
A 30-ton truck crane converts to a tower-type unit capable of handling 10,000 lb at a 20-ft radius at heights to 150 ft. Mounted on an 8x4 carrier with hydraulic outriggers, the Mobiltower handles 5,000 lb at a 60-ft radius. Equipment required to convert the 37-M includes a 2½-ft insert with jib connection for main boom, hoist line fairlead, jib bridle, boom deflecting sheaves, and wheeled outriggers.—Marion Power Shovel Co., Marion, Ohio.

Circle 302 on Reader Service Card

Water Tank Fits Scraper Suspensions

Rated at 8,000 to 8,500-gal capacity, a new water distribution unit can be hooked up integrally with the tractor unit, gooseneck, and rear scraper suspensions of Cat DW20, DW21, or LeTourneau B units. In various tank capacities, the Water-Master has internal baffles and gussets for added strength. Four individual spray nozzles are air controlled from a console next to the operator.—Shepherd Machinery Co., 3400 S. San Gabriel, Los Angeles.

Circle 303 on Reader Service Card



Remote Control for Mixers

A new drum mixer control enables one man to control the concrete discharge at a distance. The control can be fastened to the end of the mixer chute or operated with a 30-ft air line for long distance pours. The air-operated, push-button control draws air from the truck's brake system. The device is free of electrical maintenance since it actuates the drum brake as well as the drum clutch. Chain Belt Co., Milwaukee 1, Wis.

Circle 304 on Reader Service Card

Clean Air for Dirty Work

Clean air on dusty earthmoving jobs is assured the operator wearing a new health protective system. Air enters the primary screen, which takes out all large particles. Air is then taken through a centrifugal filter-blower which discharges other matter. The air then passes through a fine particle filter that removes particles to one micron. A flexible hose delivers air to fiberglass helmet.—Jamieson Laboratories, 7900 Haskell, Van Nuys, Calif.

Circle 305 on Reader Service Card

EQUIPMENT NEWS . . .

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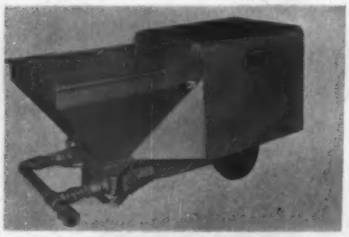


Design Reduces Maintenance On Mortar Placing Unit

The Mor-Flo Sandy has no rotor, stator, hydraulic pump, transmission, springs, or cams. Powered by a 9-hp Briggs and Stratton engine, the unit features self-cleaning valves, piston rings that are replaceable without disconnecting the piston rods, pop-out valve seats, and flush-out plugs to make cleaning possible without removing the hose. It weighs 590 lb and is 29-in. wide.—Muller Machinery Co., Metuchen, N.J.

Circle 306 on Reader Service Card

Utility and Dump Body Combined in One Unit

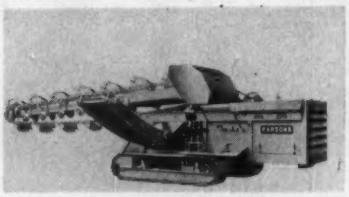
A versatile utility dump body for chassis from ¾ to 2 tons has a 3½-cu-yd capacity. The utility part of the body has weatherproof compartments with adjustable shelves and trays for equipment and tools. When the dump body tilts, the utility body remains stationary. — Morysville Body Works, Inc., Boyertown, Pa.

Circle 307 on Reader Service Card

Automatic Conveyor System For Aggregate Handling

The operator of a new conveyor system for material handling can route material to the proper bin compartment and monitor the flow of material with the help of sensing devices along the belt. An alarm system rings a bell and shuts down the system in case of malfunction. Also featured is a hopper gate that automatically regulates itself to different materials for uniform loading on the belt conveyor.—Engineered Equipment Co., 1001 Linden, Waterloo, Iowa.

Circle 308 on Reader Service Card



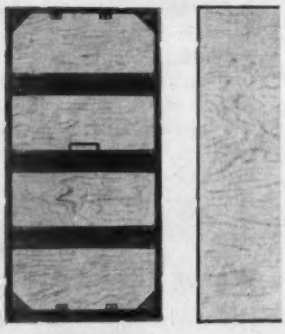
Trencher with Big Capacity Features Low Silhouette

The Trenchliner cuts an 18 to 48-in. trench up to 15 ft deep. The unit is 9 ft 2 in. high and 7 ft 10 in. wide outside its crawlers. The 225 has hydraulic actuation of steering and bucket line clutches. An optional sprocket gives 60 digging speeds—3.9 to 140.2 in. per min. Three conveyor belt speeds are available—277, 378, and 661 ft per min.—Parsons Co., P.O. Box 431, Newton, Iowa.

Circle 309 on Reader Service Card

Save time and money with NEW... ATLAS COMPO FORMS!

Concrete forming easier and more economical through design features in new-type panel form



ONLY THE NEW ATLAS COMPO FORM HAS ALL THESE FEATURES:

1. Strong 3" deep, high tensile steel frames. Rolled edges protect against bending or nicking. 2. Box shaped stiffeners in frame combine light weight with high strength and rigidity. 3. Continuous seat for plywood panel with extra supports at corners. 4. Plywood panel held to frame by "wide thread" screws to provide smooth, unmarred forming surface. 5. Specially treated, moisture resistant, plastic coated plywood panels . . . good for hundreds of reuses. 6. Panels can be quickly reversed at work site. No "lefts" or "rights"—fronts or backs. 7. Handles and lighter weight (5 lbs. per sq. ft.) allow one man to handle 2' x 8' panel easily. 8. Wide variety of sizes and adjustable fillers provide completely flexible system suitable for all forming. 9. Need less ties. Tie system carries concrete pressure directly from panel forms to the ties. Need no walers. 10. Tie system allows removal of panels at any point or time...and erection or stripping from any point.

For further information, free literature—or help in planning your concrete form work, write or call:

atlas concrete form DIVISION OF CONVER STEEL & WIRE CO., INC.

Atlas Compo Forms are available, directly from factory, for purchase, rental, or rental with option to purchase!

There are many other advantages in the new Atlas Compo Form system...and, in addition, Atlas Concrete Form Division's Engineering Department provides detailed drawings assuring maximum efficiency in the use of Atlas Compo Forms.

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Whatever you do...

drill... *blast...* *dig...* *break...* *tamp...* *pump...*

USE LE ROI AIR EQUIPMENT!

Whether you dig ditches, construct turnpikes, or carve tunnels through solid rock, remember this about Le Roi air equipment: You *never* have to take the *next best* in size or quality for *your* job!

Take **air compressors.** Nobody else offers a wider choice. Le Roi sizes range from 75 to 1200 cfm — tops in the field. Rugged Le Roi rotaries, for example, deliver rated capacity effortlessly for as long as you need it. Their light, balanced design eases on-site positioning and assures full power for greater man-tool output.

Some things you can get *only* from Le Roi . . . like the **Le Roi 1200 rotary,** the world's largest. Its twin engine and 600-cfm compressor units can be used separately — or as one unit to supply 1200-cfm air for the big jobs. The **Le Roi Tractair®** is a self-propelled air source (42-hp tractor — 125-cfm compressor) that goes anywhere under its own power, with provisions for a dozen useful attachments.

Le Roi shock-absorbing breakers and sinkers boost operator comfort and output with 55% less kick at the handle, but with full 100% bite at the bit.

You have a wide choice of breakers, sinkers, drills, spades, tampers, drivers and other **Newmatic® hand-held air tools** for light, medium, or heavy duty. For big jobs, there's a broad selection of portable tools and self-propelled **percussive and rotary rigs** designed for easy operation.

Whatever you do, standardize on Le Roi air equipment. For more information, contact your Le Roi Distributor, or write direct.

75 ROTARY COMPRESSOR (75 CFM)

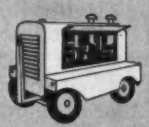
85 PISTON-TYPE COMPRESSOR (85 CFM)

125 ROTARY COMPRESSOR (125 CFM)

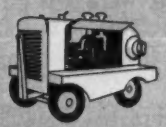
125 PISTON-TYPE COMPRESSOR (125 CFM)

TRACTAIR® (125-CFM COMPRESSOR—42-HP TRACTOR)

AIR TOOLS

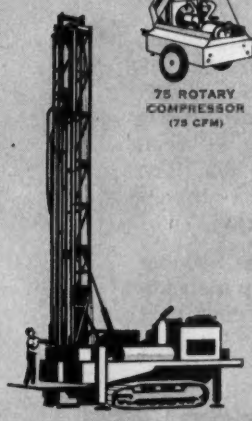


365 ROTARY COMPRESSOR (365 CFM)



600 ROTARY COMPRESSOR (600 CFM)

1200 ROTARY COMPRESSOR (1200 CFM)

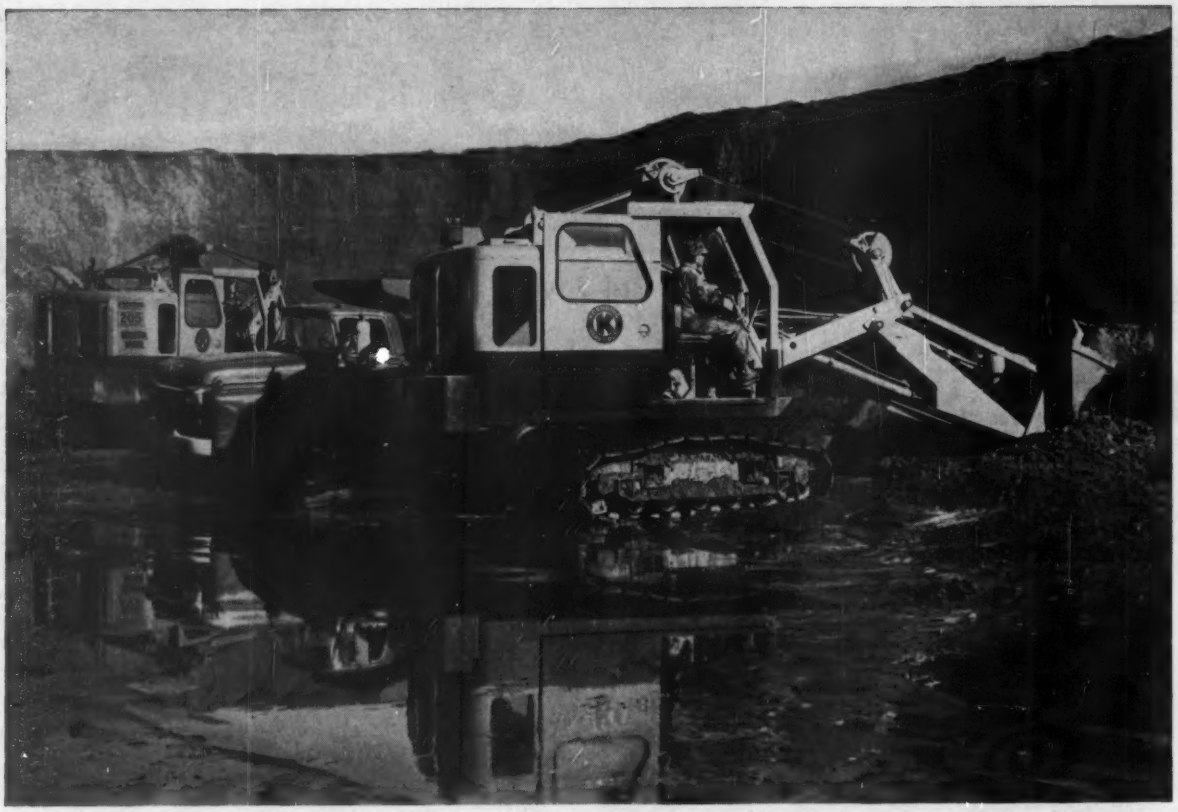


ROTARY DRILLING RIGS

TRAC-NEWMATIC

LE ROI

Division of Westinghouse Air Brake Co.
Sidney, Ohio



Ulland Bros. Add Second SKOOPER on 450,000-Yard Sand Fill Job

One SKOOPER sells another on job that is test of men and machines

Ulland Bros. put their first Koehring® 205 Skooper to work early in 1960 — used it on a variety of jobs in and around Duluth. Then the company was awarded a contract to move some 450,000 yards of dredged sand on the Duluth-Superior Bridge Project.

The job demanded two machines and Ulland set out to determine the most productive and profitable equipment for the contract. Several rubber-tired front-end-loaders were tested. Crawler models were ruled out due to the abrasiveness of the material. The Skooper served as a basis of comparison.

Water draining from the stockpiled material made loading conditions difficult. The de-watered material had a tendency to set-up, pack tight, become extremely tough to dig and move. For every two loads per front-end-loader, the Skooper dug and loaded three . . . put 15 to 16 tons in a truck on the average of 2 to 2¼ minutes. Even under the most adverse conditions the Skooper averaged between 233 and 250 yards an hour over a nine hour shift.

So . . . Ulland bought another Skooper.

Why? The Skooper's standstill dig, swing, dump cycling netted bigger payloads. Its 7-ft. level crowd coupled with its powerful hydraulic break-out force enabled the Skooper to load more — faster — than any comparable machine on the job. The Skooper proved without a doubt — there's nothing like it on wheels or tracks!

You can prove it, too! Put the Skooper through the paces at your nearby distributor. You'll be dollars ahead on your next loading contract.

K128

SEE YOUR KOEHRING DISTRIBUTOR

DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

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EQUIPMENT NEWS . . .

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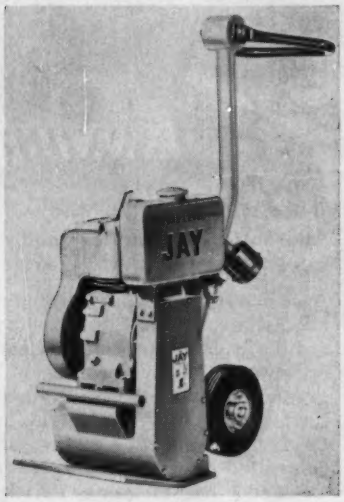

Centrifugal Clutch Made Standard on Tampers

Three Jay compaction models, J-13 (photo), J-18 and J-36 have centrifugal clutches allowing operator to stop compaction without stopping the engine. Other standard equipment includes a carburetor and fuel line that permit various engine speeds, and a polyurethane air cleaner.—Jay Co., Div. of J. Leukart Machine Co., Columbus, Ohio.

Circle 310 on Reader Service Card

High-Ceiling Grinder Smooths Without Scaffolds

A new model ceiling grinder grinds off fins and smooths ceilings from 11 to 20-ft high, eliminating the need for scaffolds. A 9-in. abrasive disk is driven by a ½-in., 18-ft-long flexible tool shaft powered by a 1-hp motor. Grinding is done at 3450 rpm.—Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.

Circle 311 on Reader Service Card

Adjustable Ramp Trailer Fits Small Tractors

A 6-ton ramp trailer, adjustable from 77-in. to 103-in. wide, will fit the tracks of small crawlers and the dual wheels of rubber-tired tractors. The trailer, with

brakes on all four wheels, will also handle loader-backhoe combinations. — Triumph Machinery Co., Willow Grove St., Hackettstown, N.J.

Circle 312 on Reader Service Card

HEY! YOUR SLIP IS SHOWING!

And *your* slip is showing, too, when your crawler tracks start spinning.

But you can restore full pulling power to your worn grousers in less than 30 minutes in the field with MARQUETTE'S Tractor Strip "retread."

And you can save 30% or more – up to $400 – of the cost of a new set of grousers by using easy-to-weld Tractor Strip. Often, it lasts longer than original grouser bars! Sizes available to fit *all* tracks.

Write MARQUETTE today for the name of your nearest dealer who handles Tractor Strip and the full line of MARQUETTE welders, welding accessories and battery charger-tester equipment.

MARQUETTE

MARQUETTE MANUFACTURING CO.

DIVISION OF MARQUETTE CORPORATION

307 East Hennepin Ave. • Minneapolis 14, Minn.

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8 PAGE CATALOG AVAILABLE
SUPERIOR Concrete Accessories
for Precast/Prestressed Concrete—
FOR ALL PICK-UP AND HOLD-DOWN APPLICATIONS

New Bulletin PR-2 contains a comprehensive selection of accessories of various capacities, design, and cost for precast/prestressed concrete. *Write for your copy!*

SUPERIOR Concrete Accessories, Inc.
Main Office: 9301 King St., Franklin Park, Illinois
West Coast: 2100 Williams St., San Leandro, Calif.

Circle 252 on Reader Service Card

CUTTING POWER!

400 holes through 24-inch walls of concrete and heavy steel!

To do a real tough job, a heavy construction firm with plenty of diamond drilling experience picked Longyear air-powered drills and 4-inch diamond bits. The rugged feed system and the powerful air motors helped finish the job on schedule. For more information on Longyear air driven and electric drills, write department 5C.

Longyear

E. J. LONGYEAR CO.
76 S. Eighth Street, Minneapolis 2, Minnesota
Phone: FEderal 9-7631 Adv. 175C

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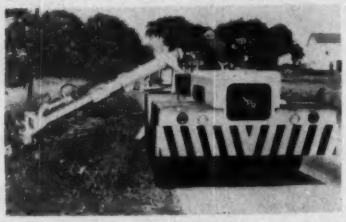
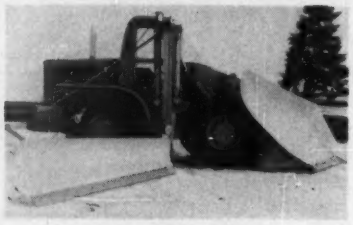


Telescoping Boom Designed For Ditch Cleaning

A new Gradall-type telescoping boom converts the Hopto 200 hydraulic backhoe to a ditch cleaner with a 14-ft 8-in. reach at ground level. The boom, available for machines now in the field, has 90 deg tilt, 190 deg swing, and controlled down pressure. It was designed for cleaning existing ditches and digging new ditches. —Warner & Swasey Co., 5701 Carnegie, Cleveland, Ohio.

Circle 313 on Reader Service Card



Snow Wings Designed For Cat Wheel Loaders

Snow wings for Caterpillar 966 and 944 wheel loaders are operated by two controls inside the cab. One control raises and lowers the wing in level position and the other control raises or lowers the outer end. Adjustment of a telescoping strut changes angle of attack. — Omsteel Steel Works, 609 S. 48th St., Omaha 6, Neb.

Circle 314 on Reader Service Card

Asphalt Cutter Slices Pavements

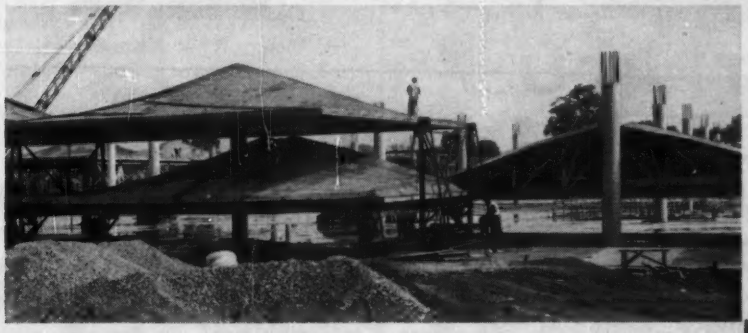
A rotary asphalt cutter that can be attached to any construction machine having hydraulic down pressure will cut pavement quickly. The steel cutting wheel is differentially heat treated and is self-sharpening. Pin construction permits lubrication in seconds.— Allied Steel & Tractor Products, Inc., Cleveland, Ohio.

Circle 315 on Reader Service Card

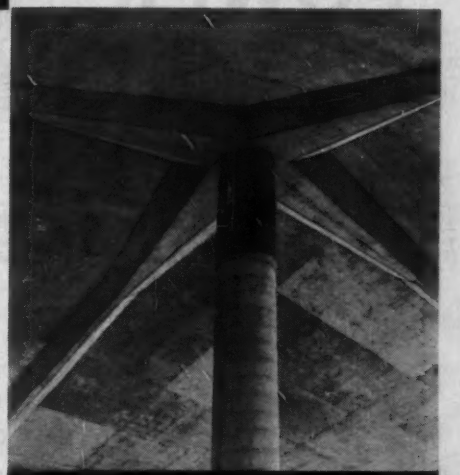
CONCRETE HYPERBOLIC PARABOLOID UMBRELLAS

Workmen place concrete for one of 45 umbrella shells at new Latham, N. Y. shopping center. Each shell is 47′ square, 2½″ thick and weighs 91,500 lbs. Roof exterior received a rough float finish and application of built-up roofing. The completed structure is 236′ x 425′ and provides 100,000 sq. ft. of floor space.

Four sets of forms were used for the entire job. Each form-half weighs 5½ tons and was raised and lowered with simple and efficient rolling jacks. After sufficient curing of the concrete, form-halves were lowered and moved to the next location. Mechanical trades moved in quickly behind the roof crews.



Each umbrella shell is supported by a single 24″ diameter concrete column. Underside of shells will be finished with ¼″ of accoustical plaster applied directly to the concrete. Lehigh Portland Cement was used throughout.



Provide Unobstructed Floor Areas, Distinctive Appearance

New concrete shell roof designs and up-to-the-minute construction techniques make for excellent results on jobs like this shopping center near Latham, N.Y. Here, umbrella-type concrete hyperbolic paraboloids provide large unobstructed floor areas at very low cost.

To help assure themselves of top quality concrete for this interesting job, Machnick Construction Company specified Lehigh Portland Cement. For *your* next job, whether it requires precast or cast-in-place concrete, remember that there is a Lehigh Cement to meet any construction need. Lehigh Portland Cement Company, Allentown, Pa.

Owner: Albany G. E. X. Corporation
Architect: Manuel Morris & Robert E. Sixta Assoc., Kansas City, Mo.
Structural Engineer: Dutton Biggs, Kansas City, Mo.
Contractor: Machnick Construction Co., Inc., Troy, N. Y.
Ready Mix Concrete: Latham Ready Mix, Inc., Cohoes, N. Y.

LEHIGH CEMENTS

EQUIPMENT NEWS . . .

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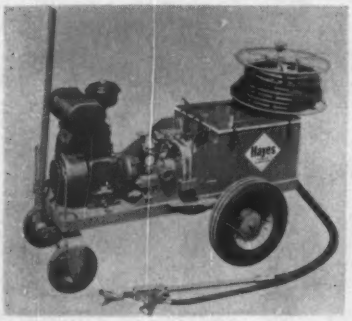


High Pressure Sprayer Cleans With Cold Water

Cold water from a faucet or tank and detergent are all that the Hayes Jet 500 needs to clean greasy equipment. The unit features an external mixing chamber for cleaning compounds, so that no chemical passes through the water pump.—Hayes Spray Gun Co., 98 N. San Gabriel, Pasadena, Calif.

Circle 316 on Reader Service Card

Telescoping Crane Operates Hydraulically

A 12-ton capacity, truck mounted crane has a boom that telescopes hydraulically, under load, from 16 to 40 ft. Grove's TM-12 has a maximum hook clearance of 44 ft. Attachments available include hydraulic clam shell, jib boom, hammer, and snow scoop. The engine, mounted on rear, is a 223-cu-in. Ford unit with six cylinders.—Grove Crane Sales Co., 15 W. 44th St., New York 36, N.Y.

Circle 317 on Reader Service Card

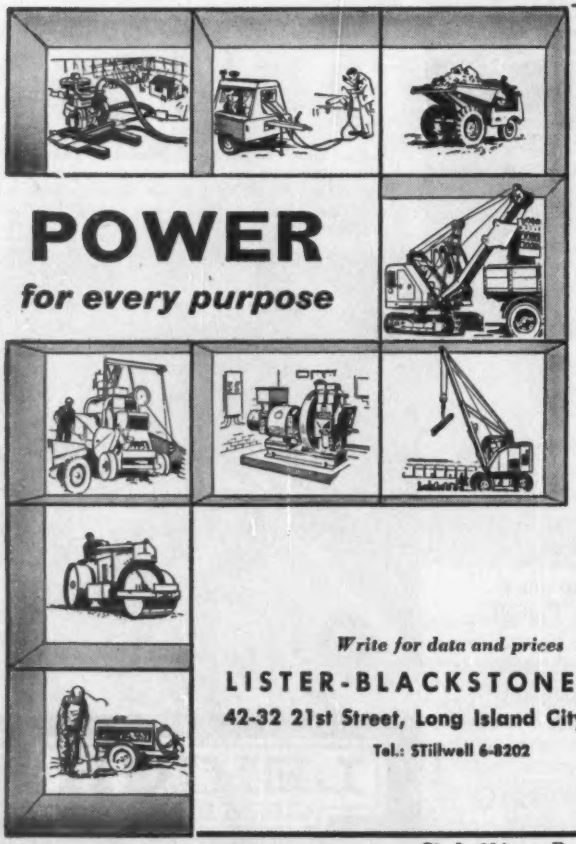
Three-Sickle Mower Cuts Wider Swath

Kromer's new mower with three sickles cuts a 25-ft swath. Hydraulic power raises the sickles, each of which is powered by its own electric motor. The engine is behind the driver for visibility.—O. W. Kromer Co., Minneapolis, Minn.

Circle 318 on Reader Service Card

Four Truck Cranes New in Lima Line

Four new truck cranes, with capacities of 25 (photo), 30, 35 and 45 tons, use the Lima 8x4 carrier



LISTER
DIESEL ENGINES

Air-Cooled 3½—72 HP

Eliminate Winter Worries!

- Built-in cold starting for sub-zero temperatures; totally enclosed working parts. No "freeze-ups".
- Engineered to suit all types of applications
- Economical operation with low fuel consumption
- Dependable power for generating sets, pumps, compressors, etc., in construction, oil fields, agriculture, mining, refrigeration, etc.

Model HB6 Air-Cooled 72 HP @ 2000 RPM

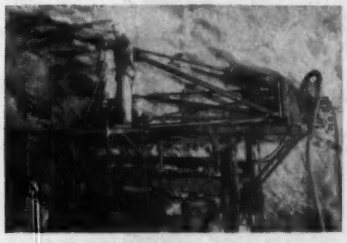
Write for data and prices

LISTER-BLACKSTONE, Inc.
42-32 21st Street, Long Island City 1, N. Y.
Tel.: STillwell 6-8202

Circle 114 on Reader Service Card

with four axles. On all models, rotating base, gear end unit and machinery side frame form a single welded assembly for added strength. Main machinery has ten, oil immersed gears. Roller path, center pintle, cone and hook rollers are replaced by a ball bearing swing circle. — Baldwin-Lima-Hamilton Corp., Lima, Ohio.

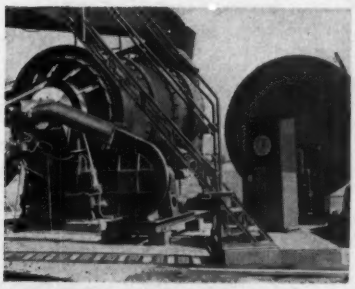
Circle 319 *on Reader Service Card*



Rock Drilling Eased By Leg Drill Support

The Long Tom, a 9-ft retractable air leg for rock drilling, is supported by a balancing cylinder during operation. The operator does not have to hold the drill, regardless of the drilling angle. A four-way pressure valve regulates air in the supporting cylinder. The unit can be crawler, rail, or tire-mounted, and rigged on single or multiple decks — Machinery Center, Inc., 1201 S. 6th W., Salt Lake City, Utah.

Circle 320 *on Reader Service Card*



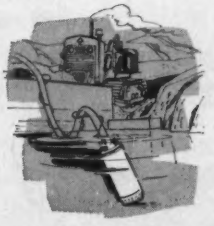
Automatic Burner Controls Available For Aggregate Dryers

Automatic burner controls now are available for all models of Barber-Greene aggregate dryers for asphalt mixing plants. The controls consist of electronic equipment that continuously measures and records the temperature of aggregate being discharged from the dryer. Automatically, the necessary burner control adjustments are then made to maintain the temperature within pre-set limits.— Barber-Greene Co., 400 North Highland Ave., Aurora, Ill.

Circle 321 *on Reader Service Card*

New, compact, heavy duty

UTILITY PUMP
FOR DEWATERING



The new, low cost PROSSER 900, ¾ H.P. portable submersible pump is ideal for construction jobs where portability and minimum installation are requirements. The pump will run on domestic power, or, it can be driven from an auxiliary 1000 watt generator.

The unit delivers up to 120 gallons per minute and can operate submerged in any position. It's safe, odorless, quiet, and requires no priming or suction hose. Unlike many submersibles, it may be operated dry for considerable periods because seals and bearings do not require outside lubrication.

The PROSSER 900 is supplied with a removable strainer, 20 ft. of cable, watertight switch and 6 ft. of power cable. Discharge and suction threads are 1½"–9 NST. An accessory mushroom strainer is available for cellar draining. The pumping unit weighs under 20 lbs. and is only 5⅜" x 11⅜" long. This new unit is the product of over 20 years submersible pump experience, assuring you dependability, long life and utility at low cost.

For further information and the name of your nearest distributor phone PR 4-8600 *or write:*

PROSSER INDUSTRIES, INC.
900 EAST BALL ROAD, ANAHEIM, CALIFORNIA

Select distributor territories now open. Your inquiry is invited.

Circle 115 *on Reader Service Card*

Pioneering?

You don't have to do it.

GM Diesel has done it for you.

Even the newest GM Diesel models have been pioneered and proved to the tune of 90,000,000 horsepower—all developed from *one* basic design.

It all goes back to the big idea that makes the big difference in Diesels: the GM Diesel *family of engines concept.*

One design throughout the line that gives you the most advanced new models with basic components proven by years of use.

One design that delivers the *ultimate in standardization savings on parts and service,* whether you use 1 engine or 100.

One design so unique, all the advances made in the future can be applied to engines in the construction equipment you buy today.

No wonder, when it comes to power, the world's leading equipment builders—and users—come to GM Diesel. It makes any equipment a better buy!

Detroit Diesel Engine Division, General Motors, Detroit 28, Michigan. (In Canada: General Motors Diesel Limited, London, Ontario.)

GM DIESEL

SERIES 53 & 71 ENGINES

One proven design throughout the line builds greater value into every engine

Circle 116 on Reader Service Card

New Product Briefs

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

BARREL GRAB for cranes will pick up barrels and boxes up to 40-in.-dia, has 2,000-lb capacity. Another model handles 1,000-lb boxes of 25-in.-dia. — Palmer-Shile Co.

Circle 322 on Reader Service Card

IMPACT DRILL for use with portable air compressor cuts holes from 3/16 in. to 4 in. in dia in brick and masonry tile.—Stanley Power Tools Div., The Stanley Works.

Circle 323 on Reader Service Card

PLASTIC pipe cutting wheel for use with the Ridgid 205 tubing cutter will cut 2-in. Schedule 120 plastic pipe.—Ridge Tool Co.

Circle 324 on Reader Service Card

TUBE HEATERS are available in 1,500, 2,000, 2,500, and 3,000-w models, all for 240-v service.—Sun-Heat Inc.

Circle 325 on Reader Service Card

PNEUMATIC HAMMER for clay digging has only one moving part, a missile-shaped steel piston—D-K Products, Inc.

Circle 326 on Reader Service Card

TORQUE TESTERS test the accuracy of hand-operated torque wrenches and torque limiting screw drivers, 0-800 in.-oz to 0-1000 ft-lb.—B. K. Sweeney Mfg. Co.

Circle 327 on Reader Service Card

EXTENSION DRILL is 12-in. long for drilling through masonry walls and hard-to-reach spots.—Beaver

Circle 328 on Reader Service Card

HEATER produces 85,000 btu on LP gas, stands 24½ in. high. The Hy-Lo releases radiant heat close to the floor for better distribution. —Scheu Products Co.

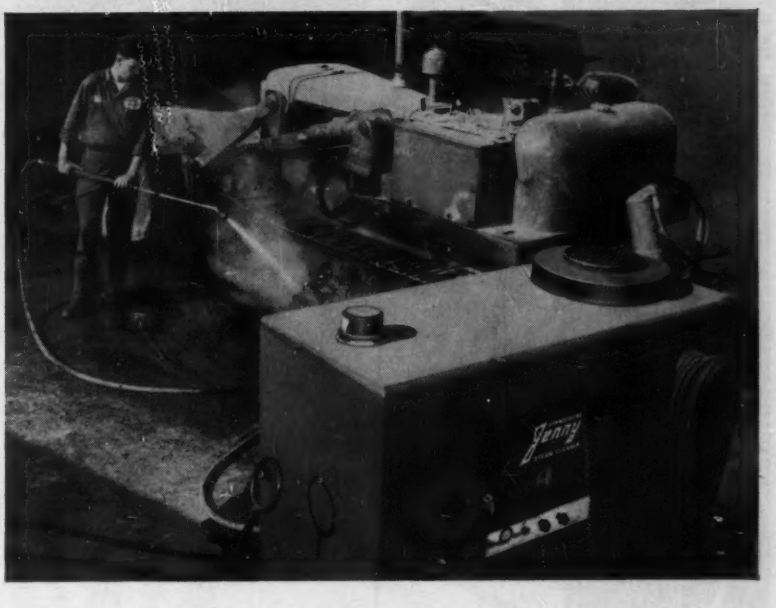
Circle 329 on Reader Service Card

ELECTRODES are now available in 18-in. length for 3/16 and 1/4-in.-dia sizes. Previously, 18-in. length was available only for larger sizes.—Rankin Mfg. Co.

Circle 330 on Reader Service Card

continued on page 118

POWERFUL "3500" JENNY® STEAM CLEANER WINS CLEAN-UP BATTLES BY FORCE



Now is the time to get rid of the caked and packed earth, the slime and muck that have accumulated on your tractors, bulldozers, scrapers, graders, wheeled equipment and ditchers. Now is the time, too, to give your repairmen a break. They do better, faster work on clean machines.

Homestead's super-powered "3500" Hypressure Jenny Steam Cleaner will do those clean-up jobs faster and better than you've ever seen them done before. It's got the guts to do it . . . a powerful wallop, a giant pumping capacity, a hard hitting cleaning gun, easy-to-read and easy-to-operate controls. The harder the job, the better you'll like it.

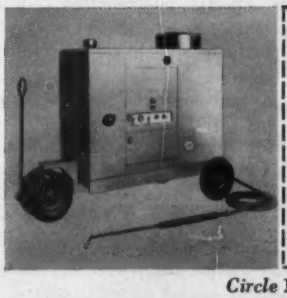
The "3500" Jenny fights its way through all tough cleaning jobs, usually cutting former cleaning time in half. As a steam cleaner, it delivers up to 250 gallons per hour; and up to 360 gallons per hour as a hydraulic cleaner. Vapor outlet temperatures and pressures are variable by the operator up to 300 lbs. and up to 325° F.

Put the "3500" Jenny to work for you. Mail coupon for full information.

hv

HYPRESSURE JENNY DIVISION
Homestead Valve Manufacturing Co., Coraopolis, Pa.

In Canada: Hypressure Jenny Sales & Service, Ltd.
517 Jarvis St., Toronto 5, Ont. (C. S. A. Approved)



Gentlemen: Please send details on the powerful "3500" Jenny Steam Cleaner.

Name.....Title.....

Company.....

Address.....

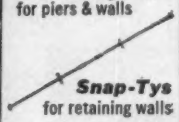
City.....Zone.....State.....

104

Circle 117 on Reader Service Card

Richmond

2 & 4 Strut Tyscrus for piers & walls



Snap-Tys for retaining walls

Hangers for decks

Screed Chairs for decks & ramps

Screw Anchors for false work support brackets

Continuous Threaded Lagstuds for columns & utility use

Reinforcing Bar Supports for decks & ramps

Most Bridge Contractors use *Richmond* Products

In bridge building, where time is money, concrete contractors have come to rely on Richmond to help them save both. All Richmond products are designed to save money by making any concreting job easier, faster and safer!

You buy 50 years of experience in the development of products for concrete construction when you specify "Richmond". Our NEW Handbook fully describes the entire Richmond line . . . write for your copy, or help with any specific concreting problem. There are more than 25 Richmond Field Engineers, in addition to a service network of more than 500 Richmond Dealers, always ready to help you.

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Circle 118 *on Reader Service Card*

NEW PRODUCT BRIEFS . . .

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

EMERGENCY LIGHT operates on 7½-v dry battery, plugs into ac outlet to give emergency lighting. The Lifesaver is equipped with two 5-in. lamps.—U-C-Lite Mfg. Co.

Circle 331 *on Reader Service Card*

ROTARY ACTUATOR converts hydraulic power into rotational motion. Rota-Cyl is available in a variety of standard specifications and sizes to meet many applications.—Graham Engineering Co.

Circle 332 *on Reader Service Card*

BLASTING agent has a density of 1.2 and speed of 14,000 fps. Austinite 30 comes in spiral wrapped fiber containers 4½ to 9 in. in dia.—Austin Powder Co.

Circle 333 *on Reader Service Card*

SEALANT gun is manually operated for remote field sites without air pressure. Metal gun uses standard 2½ and 6-oz. polyethylene cartridges.—Pyles Industries, Inc.

Circle 334 *on Reader Service Card*

PORTABLE SAW runs on a ¾-hp gasoline engine that uses a pint of fuel an hr. The C/Saw weighs 11 lb. — Comet Mfg. Div., Siegler Corp.

Circle 335 *on Reader Service Card*

COOLANT control in engines of off-road equipment is aided by a new liquid level sensing device added to Calcon's line of safety controls. —California Controls Co.

Circle 336 *on Reader Service Card*

HEADACHE BALL weighs 100 lb and comes in two sections. The "split ball" attaches to a cable with two bolts.—Miller Swivel Products Co.

Circle 337 *on Reader Service Card*

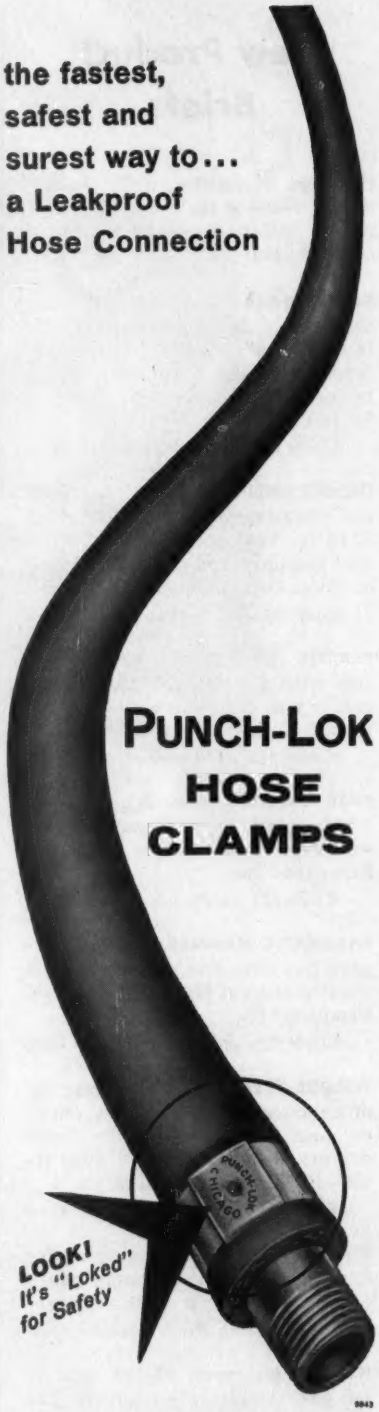
EPOXY MIXING machine measures viscous epoxy resins and then mixes them with hardener and filler in one operation.—G. Diehl Mateer Co.

Circle 338 *on Reader Service Card*

ELEVATOR for materials handling features simplified erection. Tower parts have been reduced from 24 to 6 components by prefabrication.—Universal Mfg. Corp.

Circle 339 *on Reader Service Card*

the fastest, safest and surest way to . . . a Leakproof Hose Connection



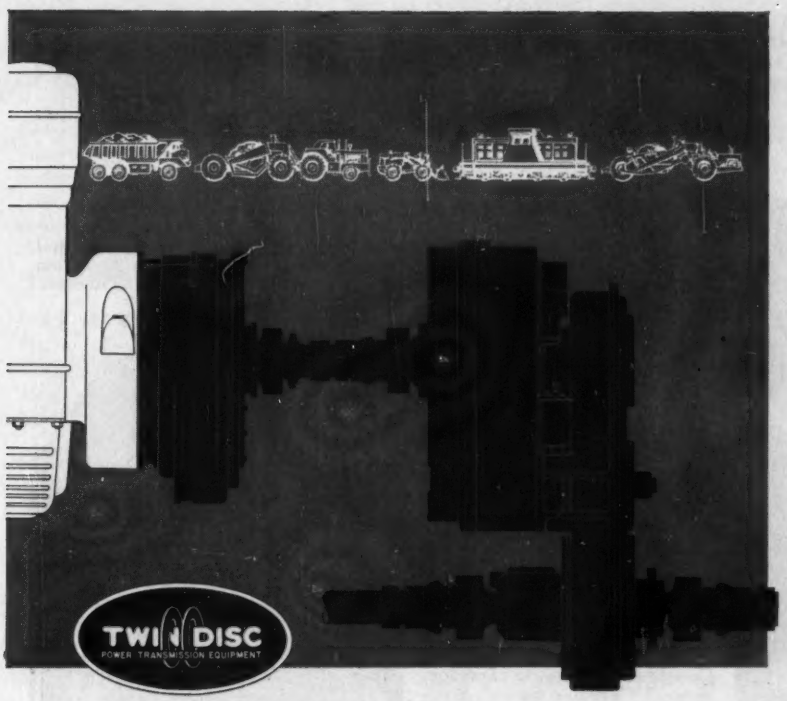
See Your Distributor or write direct for catalog and prices

The Sign of a GOOD Hose Clamp

PUNCH-LOK Company

Dept. F, 321 Justine St., Chicago 7, Ill.

Circle 253 *on Reader Service Card*



ENGINE TO AXLE WITH TWIN DISC

It's been 25 years since Twin Disc, the leading industrial clutch manufacturer, introduced the torque converter to American industry. And in that span the Twin Disc Converter has become the accepted standard of designers and operators of heavy-duty equipment around the globe.

Now the Twin Disc Torque Converter has several new and noteworthy running mates as the company's "engine to axle" program moves into high gear. This ambitious program encompasses the design and manufacture of universal joints, power-shift transmissions (complete with input and output connections), plus the controls necessary for most effective operation of this equipment.

Power-Shift Transmissions

Four of the new Twin Disc Power-Shift Transmissions are already available. Several others are in various stages of development and will soon be available for inclusion in your drive-line designs. Shown below is a "box score" chart indicating the scope of this new transmission line.

Universal Joints

Through a license agreement with Gelenkwellenbau of Germany, Europe's leading manufacturer of heavy-duty universal joints, Twin Disc is now manufacturing U-joints for the American market which incorporate all the outstanding features of GWB's time-tested design.

Currently designed is the Twin Disc-GWB "J" Series—four sizes with capacities ranging from 4,250 lbs.-ft. to 12,700 lbs.-ft. rated static torque. Offered in each size are six different types which vary as to length and as to whether slip is provided or not. All joints in the "J" Series feature caged needle bearings of the high-wing design. This design permits use of a maximum diameter bore in the bearing cap to accommodate a larger bearing. Larger bearings mean greater life expectancy for a given swing diameter.

Twin Disc pledges to its customers, both present and prospective, that they will find in the new Twin Disc Power-Shift Transmissions and Universal Joints the same quality of construction and dependability performance that have characterized Twin Disc Clutches and Torque Converters for a quarter of a century.

For engineering bulletins and application recommendations on any Twin Disc "engine to axle" product, write Application Engineering Department, TWIN DISC CLUTCH COMPANY, Racine, Wisconsin.

SERIES NO.	SPEEDS FORWARD	SPEEDS REVERSE	MAX. HP	MAX. RPM	ENGINE TORQUE ABSORPTION	RATIO SPREAD
TA-51-2000 TAD-51-2000	5	1	420	2800	1050	6.80
TA-33-1600 TAD-33-1600	3	3	335	2200	840	3.94
TD-44-1100	4	4	225	2100	560	7.11
TD-44-400	4	4	108	3000	215	6.91

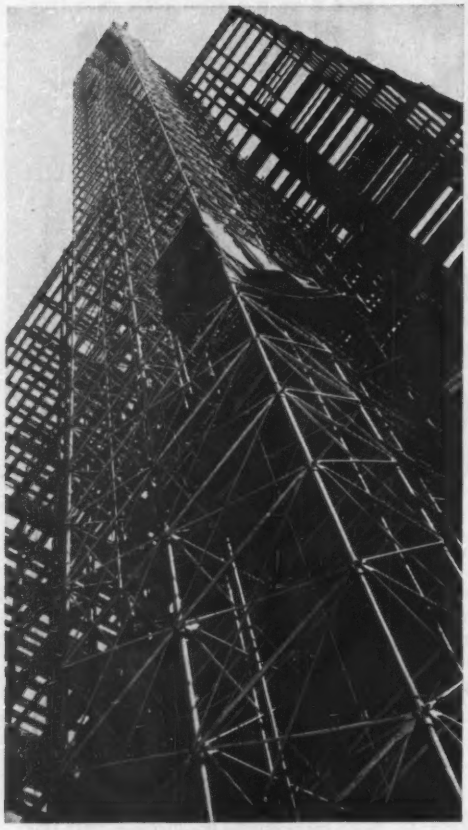
NOTE: "A" in series designation indicates straight-through countershaft; "D" indicates drop box unit.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • LOS ANGELES • NEWARK • NEW ORLEANS

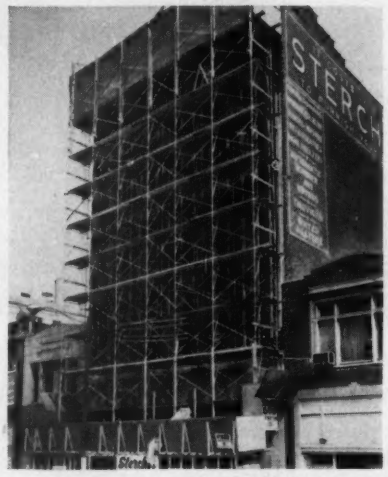
Circle 119 on Reader Service Card

Scaffolding and Shoring Methods . . . by PSCO



19-Story double hoist tower . . .

For fast lifting of materials during construction of Mercy Hospital, Baltimore, Consolidated Eng. Co., contractor, uses this 39-section, 253-ft. 6-in. high "Gold Medal"® Double Hoist Tower. "TubeLox" Scaffolding is used to make runways to each floor.

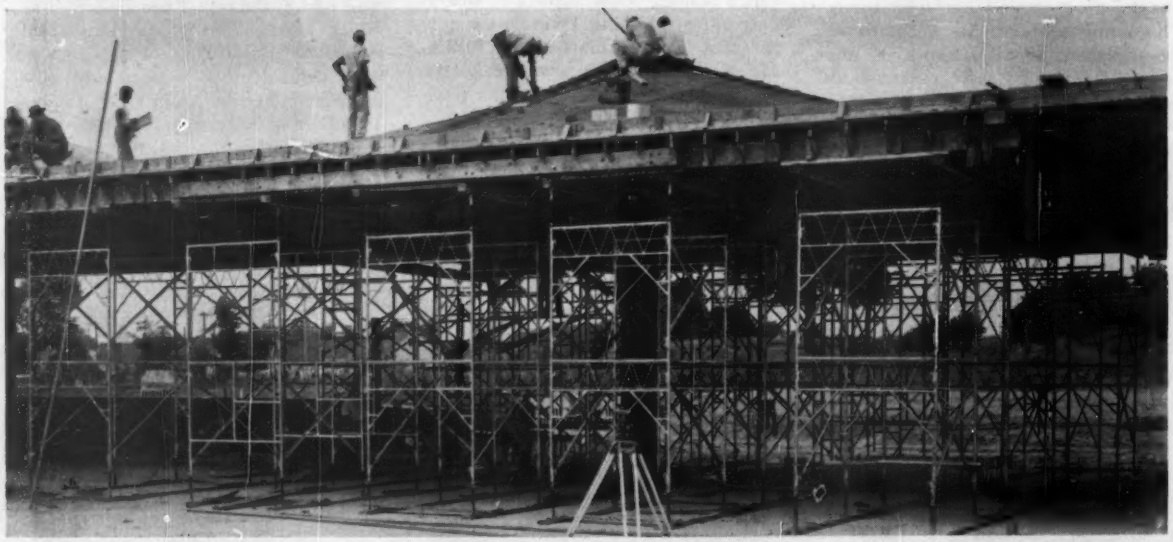


Refacing Scaffold . . .

To provide access to the entire front of Sterchi's Furniture Store, Charlotte, N. C., Foard Construction Co., contractor, uses 75 "Trouble Saver" Scaffolding frames. Planking erected on top of each row of frames provides working levels for refacing operations.

Hyperbolic paraboloid forming support . . .

This photo illustrates how easily "Trouble Saver" Shoring can be placed to support wood trusses which are used to form one of the many hyperbolic paraboloids on the new Government Employees Exchange building, Latham, N. Y. Two-frame high shoring towers, with sills attached, were slid from one paraboloid to the next.



PSCO Gold Medal Scaffolding Steel Shoring

THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street, Long Island City 1, N. Y. • 1550 Dayton Street, Chicago 22 • 6931 Stanford Avenue, Los Angeles 1
® Branches in All Principal Cities • IN CANADA: Canadian Patent Scaffolding Co., 329 Dufferin Street, Toronto

Circle 120 on Reader Service Card

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy of the items you want, circle the appropriate numbers on the READER SERVICE CARD just inside the back cover of this month's issue.

COMPACTION—Factors that Influence Field Compaction of Soils, Bulletin 272, contains performance characteristics of various types of compactors, methods used to maintain control of moisture content and density, and the results of various compaction experiments. The 254-p. book is $4.—Highway Research Board.

Circle 340 on Reader Service Card

PUMPS—A 1,008-p. catalog on the Allis-Chalmers pump line gives engineering data on centrifugal, axial, and mixed flow pumps, parts listings and prices, and 64 pages of charts required in the application of moving liquids.—Allis-Chalmers Mfg. Co.

Circle 341 on Reader Service Card

DAM BUILDING — The use of Pozzolith in 25 major dams around the world is described in a 48-p. booklet.—Master Builders Co., Cleveland, Ohio.

Circle 342 on Reader Service Card

TRAFFIC CONTROL—American Standard Manual on Uniform Traffic Control Devices for Streets and Highways, D6.1-1960, establishes specs for traffic control devices required for road construction and maintenance operations. Cost: $2.—American Standards Association.

Circle 343 on Reader Service Card

DREDGE—The use of a hydraulic dredge in aggregate recovery is the subject of a report.—Ellicott Machine Corp., Baltimore.

Circle 344 on Reader Service Card

PRESTRESSED CONCRETE—A 20-p. booklet illustrates various applications of prestressed concrete, with reasons why it was used in each case.—Prestressed Concrete Institute, Chicago, Ill.

Circle 345 on Reader Service Card

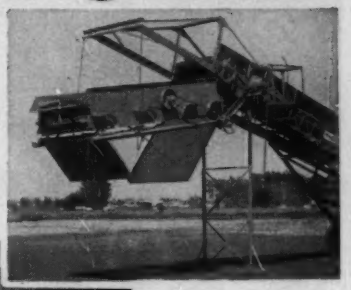
STARTER — An electrically operated heating unit that draws cold water from gasoline or diesel engines, then circulates

KOLMAN MODEL 101 PROVES VERSATILE AS AGGREGATE PRODUCTION UNIT

48" x 10' KOLMAN TRIPLE-DECK Screen on 50' x 42" Model 101.

Extra Big Multi-Deck Screens Give High Capacities on Portable Plant

With a choice of single, double, or triple deck screens on the KOLMAN Model 101 Portable Conveyor-Screen Plant, a variety of operations in the production of aggregate can be performed easily and economically. Making specification material, prescreening ahead of crushers, scalping and rejection, classifying, washings, blending, or simply high-speed loading—all are efficiently accomplished with this rugged, low cost plant.



Above, 5' x 12' double-deck screen on Kolman 101.

Left, two 5'x12' single-deck Kolman screens were mounted on 60'x42" 101 conveyors to produce over 2,000 t.p.h. of minus 1½" base coarse gravel.

And complete versatility is provided through the wide choince of feeding accessories available on a KOLMAN Plant. Push Loading opertions are handled with a Dozer Trap or a Feeder-Trap Combination — "Top Loading" with Hopper or Feeder-Hopper Combination and a Conversion Hopper for Traps makes either Push Loading or Top Loading feasible with the same plant.

Send for more details about how KOLMAN Plants, as well as other KOLMAN aggregate equipment, can fit into your materials producing picture. You'll be glad you did.

Write for Literature

KOLMAN MFG. CO.

5900 West 12th St.

Sioux Falls, South Dakota

Circle 254 on Reader Service Card

BEST

for gunning...

model G-4A

for batching on the job or use a wet or dry transit mix

Write for catalog No. GA30

places 10 cubic yards of concrete per hour . . .

TRUE GUN-ALL

...conveying...grouting

The True Gun-All G-4A is a versatile, all-purpose pneumatic concrete machine that does all jobs well. Economically, too, because of its high production of REAL concrete containing up to ¾ inch aggregate. Needs only 365 cfm compressor. (Smaller models available)

a division of

DETROIT TOOL ENGINEERING CO.

P. O. Box 232/Lebanon, Missouri

Circle 121 on Reader Service Card

SHORT CUT TO LONG LINES

Save Work and Speed the Job with NAYLOR Pipe and Wedgelock Couplings

For air, water and ventilating lines, you'll save time and money with this NAYLOR combination.

NAYLOR pipe is light in weight, easy to handle and install. Its lock-seamed, spiralwelded structure assures extra strength and safety.

WEDGELOCK couplings provide a positive connection securely anchored in standard weight grooved ends. Speed the job. A hammer is the only tool required to connect or disconnect them. Available in low-pressure and heavy-duty types.

Write for Bulletin No. 59 on pipe, fittings and couplings.

NAYLOR PIPE *Company*

General Offices and Plant
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60 East 42nd Street, New York 17, N. Y.

Circle 122 on Reader Service Card

NEW PUBLICATIONS . . .

For more information, circle the key number found at the end of each item on the READER SERVICE CARD. which is just inside the back cover.

warmed water through an engine for cold weather starting is described in a catalog.—Kim Hotstart Mfg. Co., Spokane, Wash.

Circle 346 on Reader Service Card

LIFT-SLAB—A 4-p. booklet describes a Youtz-Slick lift slab job in which 830-ton slabs were hydraulically jacked up columns.—The Master Builders Co., Cleveland, Ohio.

Circle 347 on Reader Service Card

CRAWLER RIMS — Replaceable sprocket and idler rims for crawler tractors are the subject of a bulletin. — American Manganese Steel Div., Chicago Heights, Ill.

Circle 348 on Reader Service Card

ASPHALT CEMENT—Effect of Aggregate Coating on Hardening of Asphalt Cement is a 21-p. study of factors causing cracking and delamination.—National Bituminous Concrete Association, Washington, D.C.

Circle 349 on Reader Service Card

SANDBLASTING — A line of sandblast equipment and accessories that features models in 100, 200, and 300-lb capacities is the subject of a 4-p. folder.—P. K. Lindsay Co., Inc., Everett, Mass.

Circle 350 on Reader Service Card

FLY ASH—Fly Ash in Concrete is based on a review of literature from 1934 to 1959, along with studies of construction involving fly ash. Price is $3.00.—Highway Research Board, Washington, D.C.

Circle 351 on Reader Service Card

CONCRETE BUCKETS—Double clam gate and roller gate type concrete buckets are described and illustrated in a bulletin.—Blaw-Knox Co., Equipment Div., Pittsburgh.

Circle 352 on Reader Service Card

SEISMIC TIMER—A bulletin describes a seismic timer for subsurface exploration. It is used for locating hardpan, water tables, and rock strata at depths up to 100 ft. The unit uses seismic shock waves generated by a hammer impact or small explosive charges.—Soil-Test, Inc., Chicago.

Circle 353 on Reader Service Card

POSEY

IROQUOIS DRYERS

Continuous drying and heating for all types of bituminous paving aggregates. Standard and special sizes engineered for your tons-per-hour requirements.

Write for free 16-page catalog for asphalt plants and equipment.

POSEY IRON WORKS INC.

Custom Fabrication For Over 50 Years

DIVISIONS:
• Iroquois Asphalt Plants • Mixers and Blenders
• Tunnel Forms • Industrial Heating • Foundry
• Large OD Steel pipe

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Circle 255 on Reader Service Card

MAYO KOEPE HOISTS

. . . offer lower initial costs, greater day-to-day economy for tunnels and small mines.

FREE Bulletin 20-A illustrates and describes installations of Mayo Koepe Hoists, Head Frames, Sinking Frames and other shaft equipment. Send for your copy today.

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MAYO

MAYO TUNNEL AND MINE EQUIPMENT

LANCASTER, PENNA.

Circle 256 on Reader Service Card

The Verrazano-Narrows Bridge is being built by the Triborough Bridge and Tunnel Authority. Consulting engineers are Ammann & Whitney. Sub-contractors: Steers-Snare

ANCHOR BOLTS *for Verrazano-Narrows Bridge*

Fifty-four anchor bolts have gone into each of the two 37-ton anchor bolt frames, which will secure the 630-ft-high Staten Island Tower of New York's Verrazano-Narrows Bridge to its massive concrete pier. The 3-in.-diameter bolts are 21 ft, 9 in. long. After the frames are positioned, they will be embedded in the pedestals for support of the tower legs. The anchor bolts provide the necessary resistance to uplift which occurs, at the base, during the bridge construction phase.

Specially manufactured at Bethlehem's Lebanon, Pa., fastener plant, these king-size bolts required exacting tolerances, since all future work on the huge tower is dependent upon close fit, as well as precise location of the bolts and their connections within the tower base section.

This precision workmanship is characteristic of all Bethlehem fasteners for construction: tie rods, turnbuckles, and clevises; concrete form stakes; U-bolts; high-strength bolts; rivets; and many other standard and special fasteners . . . in a wide choice of sizes, styles, coatings, and finishes.

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Steel

for Strength
. . . Economy
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ALPHA
BETTER CONSTRUCTION THROUGH
BETTER USE OF CEMENTS
news and notes from the field

Overcoming the Problems of Winter Concreting

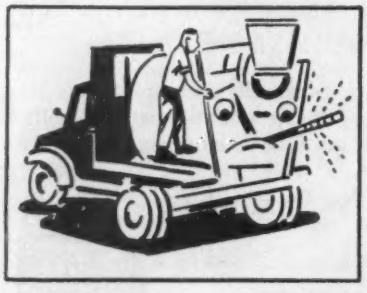
73°F is usually considered to be the practical temperature for hydration, the chemical reaction in concrete that takes place between cement and water. At temperatures higher than that, the rate at which concrete hardens and gains strength is accelerated. At lower temperatures the rate is retarded. At 32°F the rate is very slow, and below freezing there is practically no gain in strength. Successful winter concreting requires that the temperature of the concrete when placed be high enough so that it will harden; and that the concrete be kept at a suitable temperature until it has gained ample strength.

The following precautions will help avoid difficulties and costly failures in cold weather concreting.

Preparing the Subgrade

Concrete should never be placed on a frozen subgrade because of the danger of settlement when the ground thaws. All ice and frost should be removed from inside the forms and from reinforcing steel. This is done best with live steam.

Effects of Temperature



Use heated concrete when air temperature is expected to be 40°F or below within twenty-four hours of concrete placing. The temperature of the heated mix when placing in the forms should be at least 70°F to allow for initial heat loss to forms and subgrade . . . however, the concrete should never be heated over 80°F.

Concrete must be properly placed and adequately protected to avoid damage even though heated concrete is used.

If average daily temperatures are expected to be below 55°F in the next several days, continuous protection is necessary to keep concrete temperature to a minimum of 50°F for at least five days. This is essential as concrete must gain sufficient strength . . . above 1500 p.s.i. . . . to resist the effects of freezing.

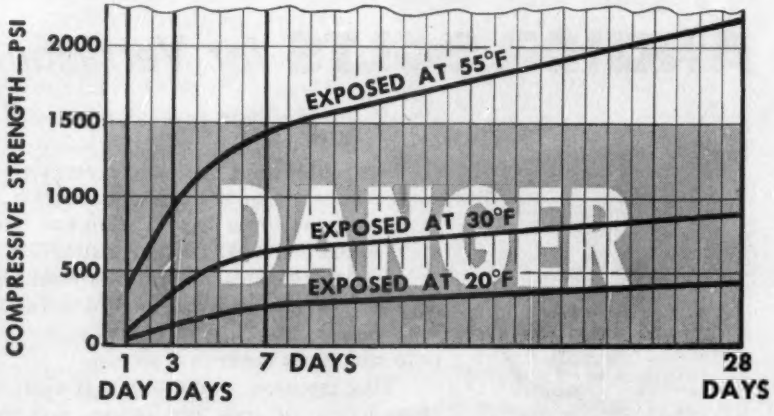
When artificial heat is used, the concrete must be protected from drying out. It should also be protected from direct exposure to rain and sleet when heat is removed . . . because *any* water-saturated concrete, less than a month old, is readily susceptible to freeze-thaw damage.

Concrete gains strength slowly at low temperatures. To obtain the given design strength in severe weather, additional cement or Hi-Early cement may be necessary.

Protection of Concrete

In fairly mild weather a covering of tarpaulins may be sufficient protection. A layer of straw covered with tarpaulins will protect against more severe conditions, but an enclosure of tarpaulins or other weathertight material with artificial heat is necessary for proper protection in many cases. Live steam will provide moisture as well as heat. In other cases radiators, unit heaters or salamanders are used.

Oil-burning salamanders used as space heaters require sufficient venting to prevent early damage to the concrete as well as danger to the workmen. They should not be placed directly on the concrete because they can cause localized drying out during the curing period.



Same mix at 70°F temperature would provide 3250 p.s.i. at 28 days.

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.
Circle 124 on Reader Service Card

Advertisers' Literature

Listed below is free material offered in this issue's advertisements received up to November 15. To get items you want, circle appropriate numbers on the SERVICE CARD inside the back cover.

ROPE TIPS—Tips on the abuses and correct uses of wire rope and slings are in a booklet.—Union Wire Rope, Armco Steel Corp.
Circle 354 on Reader Service Card

LUBER—A 28-p. catalog describes Graco's portable lube equipment for lubricating from original drums at job site.—Gray Co., Inc.
Circle 355 on Reader Service Card

ACCESSORIES—The Superior line of accessories for prestressed concrete is described.—Superior Concrete Accessories, Inc.
Circle 356 on Reader Service Card

DRYERS—A 16-p. catalog describes heating and drying for bituminous paving aggregates of all types.—Posey Iron Works, Inc.
Circle 357 on Reader Service Card

DREDGES — The Dragon line of dredges is the subject of Bulletin 980, along with a variety of uses.—Ellicott Machine Corp.
Circle 358 on Reader Service Card

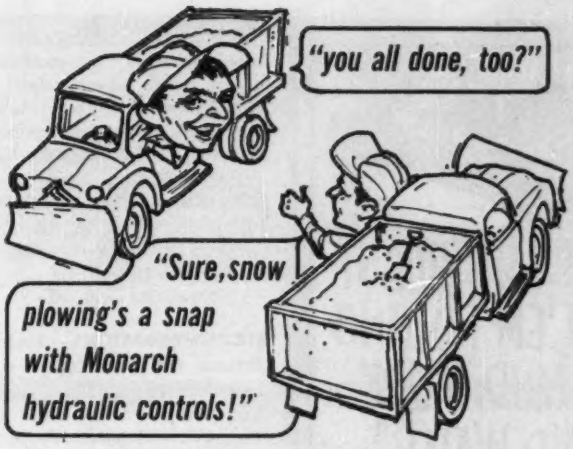
TRAILERS—Platform, low bed, and dump trailers are the subjects of three separate folders now available.—Trailmobile, Inc.
Circle 359 on Reader Service Card

JOISTS — Standard Specifications and Load Tables for Open Web Steel Joists is a 52-p. manual.—Steel Joist Institute.
Circle 360 on Reader Service Card

COMPACTION—Compacting fill in restricted areas is described in Catalog 621 and Soil Compaction Cost Data.—Barco Mfg. Co.
Circle 361 on Reader Service Card

DRILLING—A drill with 180-deg boom swing that moves on its own crawlers is in specs.—Chicago Pneumatic Tool Co.
Circle 362 on Reader Service Card

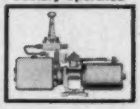
GUNNING — Catalog GA30 describes a pneumatic concrete machine for gunning or grouting.—Detroit Tool Engineering Co.
Circle 363 on Reader Service Card
(continued on page 126)



Snow removal is faster, more efficient with Monarch Power Hydraulic Controls on your vehicle. Lift and lower your snow plow right from the cab with a flick of the wrist. Instant up-and-down action . . . automatically! Quick installation. Thousands in use nationwide. See your dealer today. Free folder sent on request.

HY-LO JACK Fan Belt Driven

DYNA-MIGHT Battery-Operated



MONARCH ROAD MACHINERY COMPANY
1363 Michigan St., N.E., Grand Rapids 3, Mich. U.S.A.

Circle 257 on Reader Service Card

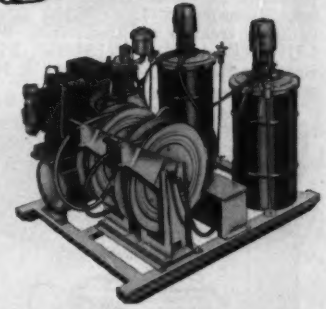
Preventive Maintenance is a Money Maker

CUT DOWN-TIME WITH A GRACO CONVOY LUBER

Strict schedules demand top-notch efficiency and rugged service from construction equipment. That's why a Graco Convoy Luber actually pays for itself by helping to prevent costly breakdowns.

Several sizes to choose from, or custom assemble luber components to fit your own particular job. These lubers provide fast greasing, oiling and air service in the field. You pump lubricants direct from original drums *on the job site.*

For more details see your nearest Graco Dealer or write for your *FREE* copy of Graco's 28 page portable lube equipment catalog.



GRACO ENGINEERS AND MANUFACTURERS

GRAY COMPANY, INC.
1246 Graco Square
Minneapolis 13, Minnesota

See Phone Book Yellow Pages "Lubricating Equipment" for Graco Suppliers

Circle 125 on Reader Service Card

"THIS LUBRICANT KEPT 'EM ROLLING IN MUD, MUCK AND WATER"

—says J. O. ARCHIBALD
of Redwood City, California

The job was clearing 500 acres of salt marsh for crystallizing ponds. To quote, "We selected LUBRIPLATE No. 107 for track and general lubrication and LUBRIPLATE APG-140 for transmissions and final drives. During the entire job there was no replacements of track rollers nor any tie-ups of equipment due to parts replacement or breakage!"

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Circle 126 on Reader Service Card

AD LITERATURE . . .

Listed below is free material offered in this issue's advertisements received up to November 15. To get the items you want, circle appropriate numbers on the SERVICE CARD inside the back cover.

FORMING—Forming brackets with 30,000-lb tie strength for high, curved, or battered walls are described in literature.—Jahn.
Circle 364 on Reader Service Card

RECOMMENDATIONS—Recommendations for wire rope use are in a booklet.—American Cable Div., American Chain & Cable Co., Inc.
Circle 365 on Reader Service Card

DOZERS — Crawler dozers and loaders in a diesel power range from 122 to 225 hp are in Bulletin LM-1167.—Eimco Corp.
Circle 366 on Reader Service Card

HYDRAULIC CONTROLS—Hydraulic controls for snow removal equipment are described in a folder.—Monarch Road Machinery Co.
Circle 367 on Reader Service Card

LUBRICANT—The Lubriplate Data Book describes heavy equipment grease. — Lubriplate Div., Fiske Brothers Refining Co.
Circle 368 on Reader Service Card

DEWATERING—Moretrench's wellpoint system is the subject of Catalog 1000.—Moretrench Corp.
Circle 369 on Reader Service Card

TRUCK CRANE — The P&H Model 325-TC truck crane with attachments is described in literature and specs.—Harnischfeger P&H.
Circle 370 on Reader Service Card

WIRE ROPE—Roebling's Royal Blue wire rope for various applications is described in a booklet.—John A. Roebling's Sons.
Circle 371 on Reader Service Card

FORMS—Atlas Compo forms are described in literature. — Atlas Concrete Form Div., Conver Steel & Wire.
Circle 372 on Reader Service Card

HOIST—The Quick-Way bulletin describes the replacement of hoist shafts on rubber-tired cranes.—Quick-Way Crane-Shovel Co.
Circle 373 on Reader Service Card

PUMP—A 3-in. submersible pump with cast-iron intake and aluminum casting is the subject of literature.—Marlow Pumps.
Circle 374 on Reader Service Card

How to Save At Least One Cent Per Cubic Yard On Your Excavation Costs

Excavation is generally the biggest single pay item of a highway or street job, and it gets—and deserves!—a lot of your attention.

If a method, or machine, is found that will cut excavation costs by even one cent per cubic yard, you will usually buy it—it means important savings to you!

But there is another part of your work which gets little attention (it isn't spectacular, and it isn't a separate pay item) where even bigger savings are not only possible, but easily attainable—and that is in finish grading.

Look at it this way—on the average highway job **there is a square yard of finish grading for every cubic yard of excavation.**

Check your last few jobs and see for yourself! **So it follows that a penny per square yard saved on finish grading is exactly the same as a penny per cubic yard saved on excavation.**

The Preco Automatic Blade Control, installed on one or more of your graders, can save you 1¢—2¢—or even 3¢ per square yard on grading costs—you can prove this, on your own job. It is an irrefutable fact.

Call your Preco dealer, or Caterpillar Tractor Co. and LeTourneau - Westinghouse Co. dealers and a representative will visit your job and show you how. Call today—because every day *without* this method is costing you money.

(Advertisement)

Circle 258 on Reader Service Card

FOR:
HAULING
WINCHING
DELIVERING
PUSHING
PULLING
POWERING
ON ROAD
OFF ROAD
ALL WEATHER
SERVICE,

GET A 'Jeep'® FLEET!

If there's a job to be done, there's a 'Jeep' vehicle to do it. A tremendous array of 'Jeep' approved special equipment handles thousands of specialized jobs. Traditional 'Jeep' ruggedness keeps 'Jeep' vehicles on the job years longer in any kind of weather, in any kind of "going" ☐ A 'Jeep' fleet is a sound business investment. Initial cost is low. Maintenance costs are low. And resale value is amazingly high. In fact, a two year old 'Jeep' Universal sells for up to 90% of original list price ☐ Find out about the 'Jeep' vehicles that are specifically designed to meet your needs. Write to R. J. Kreusser, Fleet Sales Manager, Willys Motors, Inc., Toledo 1, Ohio.

'JEEP' FLEETS—FROM THE WORLD'S LARGEST LINE OF 4-WHEEL DRIVE VEHICLES

Willys Motors, Inc., Toledo 1, Ohio. One of the growing Kaiser Industries.

Circle 127 on Reader Service Card

DIESELS:

Shell reveals how a special additive in Shell Dieseline can help you cut downtime and maintenance costs

Shell Dieseline® contains a remarkable additive called FOA-5X®. This additive was developed by Shell Research specially to help keep fuel line filters clean, and prevent injector corrosion.

Read how Dieseline with FOA-5X can help you cut downtime and maintenance costs—and get top engine performance.

Shell Dieseline is available in grades to meet all engine requirements. Ask your Shell representative to specify the correct grade for your equipment.

SHELL Dieseline contains a special additive called FOA-5X®. Here are three important moneysaving jobs FOA-5X does for your diesel fuel systems.

1. FOA-5X helps keep Shell Dieseline clean and free of sediment, even during prolonged storage.

2. FOA-5X can help reduce diesel engine downtime by helping fuel filters and injectors to remain unclogged and clear. It inhibits sediment formation and helps keep tiny contaminants finely divided so they flow freely through screens and nozzles.

3. FOA-5X helps prevent corrosion and rust.

Maximum economy

The uniformity of Shell Dieseline enables injector nozzles to work efficiently. And it lets your mechanics tune an engine's fuel injection system for maximum economy.

The viscosity of all Dieseline is controlled to help provide proper lubrication of pumps and injectors.

Minimum knock, fast starting

The ignition quality, measured by cetane number, is tailored to your engine requirements. Results: controlled combustion, minimum diesel knock and good starting characteristics.

Shell Dieseline can help produce maximum engine power. And can make a significant difference in your diesel equipment. That difference is *top engine performance.*

Grades for all engines

Shell Dieseline is available coast to coast in grades to meet all engine requirements.

How to learn more about Dieseline

For additional information on Shell Dieseline, contact your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A Bulletin from Shell
—where 1997 scientists are working to provide better products for industry

Circle 128 on Reader Service Card

How To Loosen Winter's Grip On Crawler Tractors

WINTER DOZING—Careful preparation for winter kept this International TD-25 crawler in operation in Indiana, even when temperatures fell below zero. Canvas coverings over the hood are one way to equalize engine temperatures in very cold weather.

CRAWLER TRACTORS are winter workhorses because poor traction in cold weather often sidelines other types of equipment. Here are some tips on how to get prompt starts and effective service from your crawlers, even in near-zero temperatures.

First of all, make sure your crawler tractors are in good mechanical condition. No equipment in poor mechanical condition will start and operate properly in winter weather. Worn parts that may hold up in summer will fall down completely with the first freeze. Quick diesel starts depend on good compression through sound ring and valve performance. The injection system must be timed to deliver fuel at just the right instant.

The ignition system must be correctly adjusted. Worn wiring and poor connections set up terrific resistances during low temperatures. Battery condition is probably the most important single factor in getting prompt starts.

A full battery charge must be maintained at all times. L. R. Keith, assistant general supervisor for service at International Harvester Co., points out that at 10 deg batteries lose 50% efficiency. With only an 80% charge, you have only a 40% chance of getting a good start. At 20 deg, even fully charged batteries become balky.

The quickest way to bring a cold battery back to life, says Keith, is to submerge it in warm water to within 2 in. of the top plates.

All gaskets, especially at the cylinder head and manifolds, must be in good condition. Check all hose connections to prevent leakage of costly anti-freeze. The permanent type of anti-freeze, Ethylene Glycol, is recommended for diesel use. Most contractors find it advantageous to pre-mix anti-freeze in large batches.

There are many special attachments that make operation of a crawler tractor more efficient during winter. Radiator shutters are probably the most common. By keeping them closed during starts and opening them as needed after reaching operating temperature, fast warm-ups can be attained.

Hood side doors also help to raise and equalize engine temperatures. A canvas housing has the advantage of providing warmth for the operator.

High temperature thermostats will maintain higher engine temperatures, too. But check your operator's manual for the proper setting.

Many attachments are available to make cold weather starting quick and easy. If your diesel crawler has an inbuilt gasoline starting system, a primer is available to inject raw gasoline into the intake manifold. Six to eight pumps of the primer prepare the engine for quick sub-zero starts.

Direct starting engines can be equipped with an ether injection system. This highly volatile liquid fires quickly and will have the largest diesel running smoothly in 3 or 4 min.

Another diesel starting system uses glow plugs to warm the combustion chambers. A minute or so of pre-warming with the glow plugs will usually have the engine ready for a first try start. Of course, the glow plugs must be in good condition and delivering the rated voltage. Never try to supplement the operation of poor glow plugs with ether fluid.

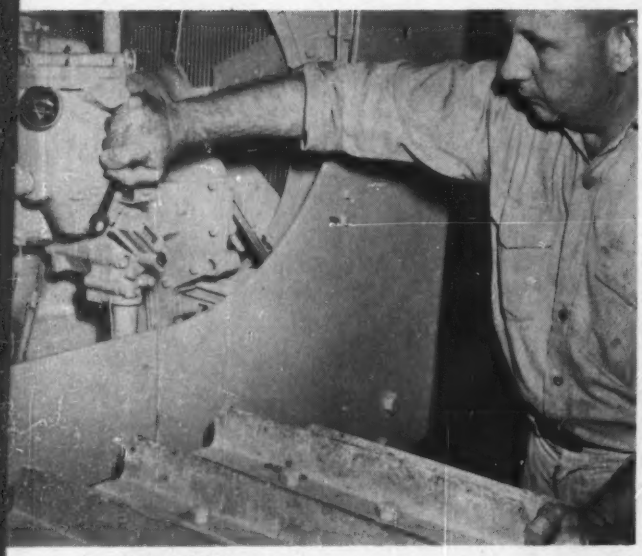
To round out the list of special winter equipment, don't forget that cutaway sprockets and special ice or snow track chain grousers are valuable aids in many winter applications.

With your crawler mechanically ready for winter, the next step is to use the proper lubricants. Select lubricants to meet your lowest expected operating temperature.

If temperatures in your area dip below 10 deg, use SAE 10W crankcase oil and SAE 80 multi-purpose gear lube. From –10 deg to –25 deg, dilute 10W oil with about 10% kerosene and use sub-zero gear lube MIL-L-10324. Because lube oils have a tendency to thicken in use, it's wise to add one quart of extra kerosene to the crankcase each week. If temperatures sink below –25 deg, use MIL-O-10295 crankcase oil.

When adding oil to the crankcase, fill the filters separately. Oil then will be available instantly for bearing lubrication. After changing oil, run the tractor without load for 5 or 10 min before putting it to work. This allows the thinner winter-weight oil to work into the cylinder walls and bearings.

Start using winter grade fuel with the first sign of frost. To assure free fuel flow, use fuel with a



DRAIN WATER—Cold temperatures condense moisture, which sometimes settles to the bottom of the fuel filter housing. To get rid of it, drain the fuel tank and filter at the end of the day, after the tractor has stood idle and most moisture has settled.

pour point at least 10 deg lower than the lowest temperature during working hours. Because wax from fuel may eventually plug filters, watch the pressure gage more closely in winter.

With a gasoline starting system, use fresh, winter-grade gasoline. Protect it in sealed containers to prevent evaporation. Don't forget to operate the engine on the gasoline cycle before shutting down. This insures your engine dry, clean spark plugs when it's time for the next start. And always leave the engine with the change-over lever in the diesel position. This allows the starting valves to cool evenly on their seats.

Your operator's manual provides complete instructions for operating the direct-start ether injector, but here's one point to remember: operate the engine with the primer in the injection position only long enough to provide a successful start. Four minutes is the maximum time needed to inject ether.

No matter what type of starting system your diesel has, only use the starting motor for about 30 sec at one time. Then let it cool off.

Another tip that applies to all types of crawlers: make sure the transmission is in neutral and the engine clutch disengaged before hitting the starter button. Why ask your overworked batteries to turn over any more weight than absolutely necessary?

And remember that the most critical period of cold weather operations occurs when you put your crawler to work first thing in the morning. Care should be taken in warming up the tractor. Not only the engine, but the entire machine should be warmed up gradually to get all parts well lubricated.

To the contractor considering concrete precasting:

FMC IS FIRST IN STEEL FORMS

THEY STAY FIRST BY HELPING YOU

Providing the best forms, and backing them up with the best service keeps FMC on top. Profitable casting operations depend not only on steel forms that produce uniform, accurate members, but on forms that are designed for contractors' efficient use. FMC offers a broad line of quality steel forms for the contractor, plus years of form design experience that can save you dollars and time. FMC's capable, qualified engineering force and field engineers are always at your disposal for facts and figures on form design. Get the benefit of experienced engineering, superior service and the finest Form-Crete steel forms. Before you bid—contact FMC.

Send for your free copy of the #400 Form-Crete Catalog. Describes the entire form line and is a handy reference.

Putting Ideas to Work

Form-Crete Department

fmc CORPORATION

General Sales Offices: Lakeland, Florida

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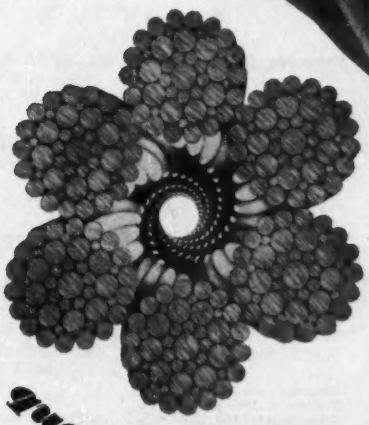
We put a lot of work into it — You get a lot of work out of it



quality inside and outside

Here are two "close-ups" of Roebling Royal Blue Wire Rope which show in part where your savings come from . . . uniformity of structure. Invisible, but equally important, is Royal Blue's *extra* high tensile strength. All the way through, Royal Blue pays off for you on every kind of wire rope job. Find out more from your wire rope distributor, or write for free booklet to Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation.

Circle **131** *on Reader Service Card*

Circle 132 on Reader Service Card

SEARCHLIGHT SECTION
(Classified Advertising)
EMPLOYMENT • BUSINESS EQUIPMENT — USED OR RESALE
OPPORTUNITIES

DISPLAYED RATE
EQUIPMENT & BUSINESS OPPORTUNITY advertising $21.75 per inch.
EMPLOYMENT OPPORTUNITIES—$37.00 per inch. Subject to Agency Commission.

UNDISPLAYED RATE
(Not available for equipment advertising)
$2.10 a line, minimum 3 lines.
Positions wanted undisplayed rate is ½ of above rate payable in advance.

FOR SALE OR RENT
MANITOWOC MODEL 4500 LIFT CRANE DRAGLINE COMBINATION, Ser. #4669 w/Independent Swing, 170' Steel Erection Boom or 140' Dragline Boom. Long Crawlers, etc., located in Leonia, N. J., Bergen County. For particulars contact:
HERCULES CONCRETE PILE CO.
P.O. Box 26 West New York, N. J.
Phone UNion 3-2521

Circle 259 on Reader Service Card

BARGAIN
7—DW-21 Caterpillar Scrapers
58C's thru 85E's
$15,000. — $35,000.
(Company Owned)
QUARE DEAL MACHINERY & SUPPLY CO.
P.O. Box 3346, Orlando, Florida
Ga 4-2411 TWX—OR-7033

Circle 260 on Reader Service Card

POSITION WANTED

Admin. Assistant—female—heavy background genl construct.-knowl. all construction office routine A-Z, procedures, sub contact etc.—own correspondence plus skills. PW-7877, Construction Methods & Equipment, Classified Adv. Div., PO Box 12, New York 36, N. Y.

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BARCO is the ANSWER!

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Methods Memo . . .

Tort Tangles Tunnel

Proposed use of diesel tunneling equipment has plunged a Washington hydroelectric project into court even before bids were received.

The Washington Public Power Supply System, the sponsor, and the Spokane chapter of the Associated General Contractors think diesel tunnel machines should be permitted at the 27,000-kw Packwood Lake project. A 17,000-ft, 72-in.-dia water conduit will be driven below a concrete dam. Several AGC members plan to bid the job.

State law, however, forbids the use of fuel-burning equipment underground. The power company and the AGC seek an injunction against the director of the state's Dept. of Labor & Industries and its safety supervisor. They are standing behind the law.

The manager of the power company said the ban against diesels would add $108,000 to the cost of the project. A hearing has been set to consider the action. In several previous cases, equipment has been allowed to work under temporary injunctions.

Contractor Paid Off In Stamps

Members of a Denver Episcopal church are paying for paving a $1,500 parking lot with trading stamps.

They made the down payment on the 115x150-ft lot by giving 500 filled books to Brannan Sand & Gravel Co., the contractor. Brannan is giving the church 12 mo more to pay the other 500 books.

When filled, the 1,000 books will contain 1,500,000 stamps valued at 1 mill each. The books are turned in to the stamp company, which will then reimburse Brannan with $1,500 for the project.

The church collects stamps by conducting carnivals, bazaars, and other functions. Church women charge stamps for admission or for making purchases. The women accumulated 500 books in the first year's activity and believe they will do as well next year.

"Safety Means Money In Our Pockets"

Michigan highway construction accidents have dropped nearly 20% since 1959, a Detroit contractor estimates. That was the year a 10-point safety program was adopted by road builders and the Michigan State Highway Dept.

A committee representing both groups worked out minimum specifications for job safety and fire prevention. Today these specs are incorporated into each highway construction contract. If a contractor fails to live up to the safety requirements, the state project engineer has authority to stop all work until corrections are made.

The revived interest in preventing accidents has benefited the state, the public, and the contractors, according to Grant Sivier, a member of the Michigan Safety Conference. He says contractors realize that safety "means money in their pockets" through reduced insurance rates and increased insurance dividends. He says that Michigan contractors have become "evangelists for safety."

Successive Signs Inform Public

An Illinois contractor borrows the familiar Burma Shave sign technique to tell the public about a highway construction job.

While paving shoulders and median strips of suburban Chicago's Edens Expressway, Arcole Midwest Corporation of Skokie has often been asked: "Just what are you doing here?" To answer the question, the contractor created a courteous, 8-ft tall character named Arky Arcole. Arky stands at 300-ft intervals holding a sign and a lantern containing a blinking warning light.

The first sign in a series reads "Arky Arcole Says" and catches the motorist's eye. Successive signs say, "For Your Convenience . . . We Are Working at Night . . . We Are Paving the Shoulders . . . And the Median Strip . . . Thanks for Driving Slow."

Another series stresses safety: "Take Time to Live . . . Keep the Holidays Safe . . . Don't Commit Hurry-Kari! . . . Continue to Drive Slow."

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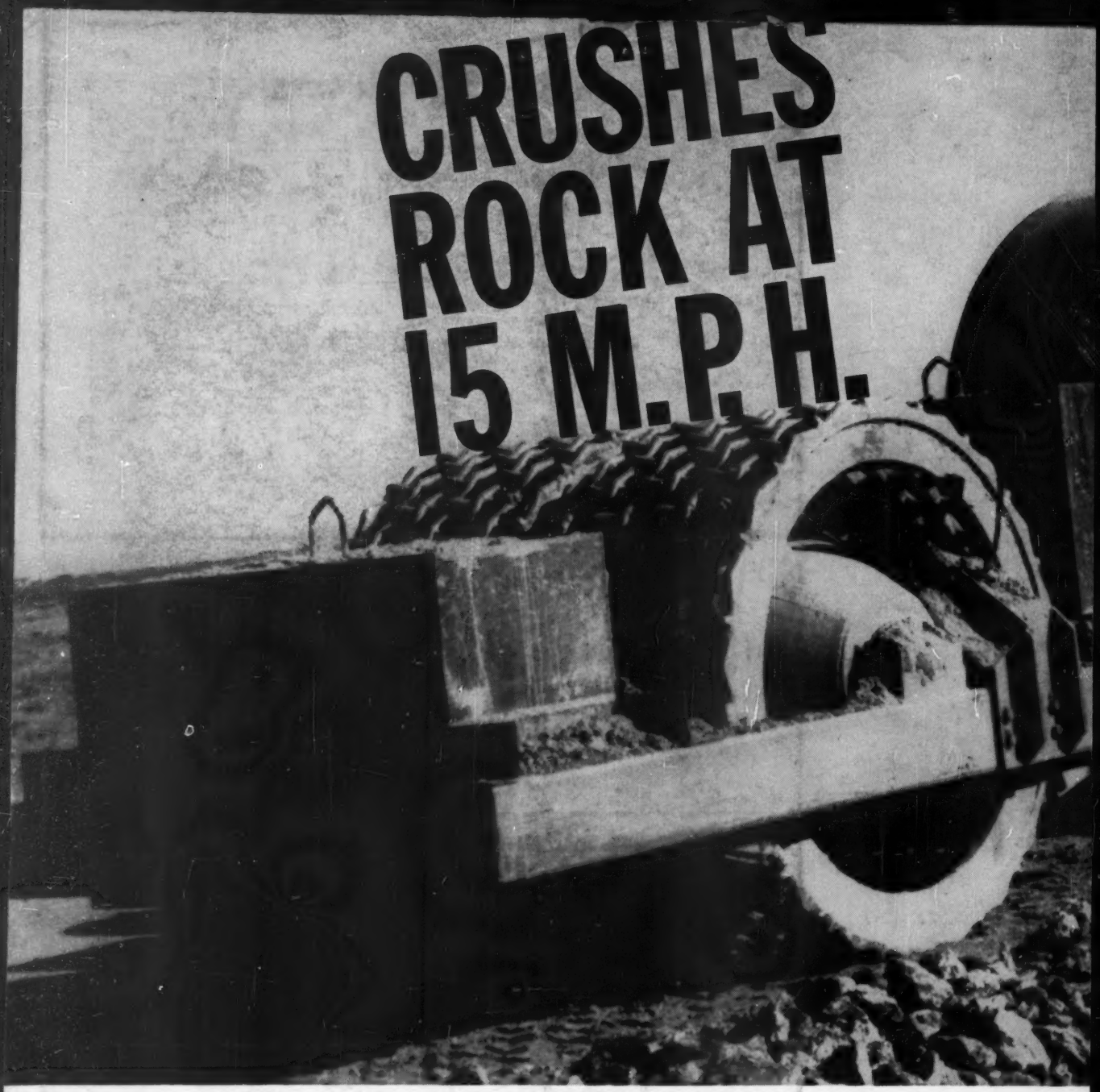

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